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SOME OBSERVATIONS ON ANIMAL RESEARCH IN GREAT BRITAIN[1]

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In the short time at my disposal I shall attempt to convey to you some idea of the type of organization which is conducting animal research in Great Britain, and at the same time endeavour to indicate the type of problems with which they are concerning themselves.

Research work in animal husbandry in Great Britain is conducted in a number of Institutes, existing either as separate institutions or organized within established Universities. In addition certain industrial concerns interested in the manufacture of products for distribution among livestock farmers carry on research programmes with staffs of highly qualified workers.

Active research in the animal field in Great Britain is a post-war development. The majority of the existing institutions interested in animal research were established out of a $10,000,000 fund which was placed at the disposal of the Development Commission, at the close of the Great War. Out of this fund land was purchased and institutions founded and subsidized in various parts of Britain. Since the period of expansion these Institutes have had to depend largely on annual grants from Parliament, though all have certain endowment funds which help them to a considerable extent. In addition, the Empire Marketing Board has assisted in the work of the institutions by financing research projects which were expected to yield results that would have an Empire application in the field of animal husbandry. In passing it may be mentioned that the Board has also financed central bureaux or clearing houses of knowledge in special branches of research to which Home, Dominion or Colonial workers may appeal for information or for references. The bureaux which are of special interest to animal workers are the Imperial Bureau of Animal Nutrition located at the Rowatt Research Institute, Aberdeen, and the Imperial Bureau of Genetics, located at the University of Edinburgh.

The animal husbandman from Canada is likely to be impressed with the fact that there is comparatively little work of what might be called an experimental nature being done. Traditional methods have been accepted by the livestock breeder and feeder, and with quite good results it must be admitted, but the results of certain experiments conducted recently suggest that some of the traditional practices could very well be made subjects for experimental inquiry. A more extensive programme of experimental work along the lines of determining the most economical methods of feeding and

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general production would likely yield results which would be very enlightening. One might venture to suggest that this would be particularly true in connection with beef cattle and sheep production.

The main body of investigation in the animal field is of what we commonly call the research type. The experimental routine in a feeding experiment goes beyond gross measurements of feed consumption and rate of growth and secures a result based upon some form of laboratory determination. Clinical symptoms arising out of a certain set of experimental conditions are not merely recorded but the deviation from a certain biological mean is determined and the cause of the abnormal symptom is thereby ascertained. This involves co-operation on the part of the animal husbandman with workers in the various biological sciences in his institution. Indeed some of the most fundamental results in animal science in Great Britain have been secured by men who are not essentially animal husbandmen but men trained in medicine and biology. One finds team-work a dominant note in connection with experimental programmes.

The typical animal research institute in Great Britain has departments of animal husbandry, biochemistry, physiology, pathology and bacteriology. It is felt that the animal husbandry worker can only touch one phase of a problem, and that in order to develop a project to the greatest advantage the co-operation of workers in the various biological fields is essential. A problem of definite economic significance to the livestock industry is designated by the animal husbandman, and with the collaboration of all departments a general experimental project is outlined. The various departments work on phases of the problem which come within their field. The results are published in part as special departmental papers, and when a project is completed the final conclusions are presented as a joint contribution of all concerned. Such an arrangement provides the various departments with valuable material for constructive research and leads to a result backed by more comprehensive and conclusive evidence.

The extensive use of small animals as an economical means of establishing certain nutritional or genetic principles is the common practice in animal research institutions in Great Britain. Once certain leads are secured in this way the farm animal is brought into use and the preliminary results are verified or rejected as the case may be. By the use of the small animal with a short life cycle, certain reactions can be quickly obtained and results secured in a shorter space of time and with less overhead involved than when the larger animals are used. Much inexpensive laboratory material can be secured in the form of blood and tissue when rats, rabbits and guinea pigs are the experimental subjects.

No attempt will be made to enumerate the various institutions engaged in animal research in Great Britain, nor to outline the various projects which are under consideration, but mention will be made of a few typical cases so that the type of organization and the class of problem being studied may be better appreciated.

The Rowatt Research Institute at Aberdeen is essentially a research institution with departments of biochemistry, physiology, pathology and bacteriology, but in addition to the laboratories, an experimental farm of 1,000 acres provides beef and dairy cattle, sheep and swine for large scale

feeding experiments. Pasture research has occupied a prominent place in the Rowatt programme, and mineral metabolism and the mineral requirements of farm animals have formed the basis for a comprehensive project. The influence of diet on disease is being studied by means of chemical analyses and serological tests to ascertain the influence of diet on the composition of the blood and its immunological properties. The processes of digestion and absorption in the ruminant and fowl are being studied and carbohydrate matabolism in its various aspects is a problem of major concern. In this field Dr. MacLeod of insulin fame (now at Aberdeen University) renders valuable assistance and is consulting physiologist. Feeding experiments with large groups of animals are carried out on the Duthie Experimental Farm. Comparisons are made of rates of growth and cost of production under different conditions of feeding, housing and management.

The Animal Nutrition Institute at Cambridge works in close harmony with the Rowatt Institute on problems of animal nutrition. Animal calorimetry has formed the basis for a considerable volume of effort at Cambridge and the maintenance requirements of farm animals have been carefully studied. A group of workers are engaged on a comprehensive project relating to the nutritive value of various feeding stuffs and are attacking the problem by analytical and digestibility methods. The work on the nutritive value of young grass and the development of methods for its preservation is well known. Mention should be made of the work of another division which is studying reproductive physiology including such subjects as the oestrous cycle, the causes of sterility and fertility, the vitality of spermatozoa under various conditions with a view to artificial insemination, the growth and development of farm animals, and the physiology of lactation and of meat and milk production. A poultry section deals with problems of poultry nutrition.

The Hannah Dairy Research Institute, at Anchincruive, Ayr, is a recently established institution studying problems of dairy production. Protein metabolism in relation to milk secretion is a major project, and existing feeding standards are being re-examined from the standpoint of the protein recommendations for dairy cows. Calcium metabolism in its relation to milk fever, including the effect of mineral deficiency on the calcium content of the blood at parturition and during early lactation is being studied in conjunction with the Royal (Dick) Veterinary College, Edinburgh. Accommodation is available for carrying out balance experiments with dairy cows. A specially built metabolism house will make it possible to carry out experiments for relatively long periods in which the separate collection of feces and urine will be possible.

The national Institute for Research in Dairying, University of Reading, is primarily concerned with questions relating to dairy production, but also carries on a good deal of nutritional work. Factors affecting the quality of milk are under consideration and small-animal feeding experiments are conducted to determine the nutritive value of milk mainly from the standpoint of its protein, mineral and vitamin content.

The Animal Breeding Institute, University of Edinburgh, is the main centre of study in animal genetics in Great Britain. This Institute owes its existing facilities very largely to an endowment by the International Education Board of the Rockefeller Foundation in 1927 and a further endowment in

1929 by Mr. T. B. Macauly, of the Sun Life Assurance Company of Canada. The latter endowment provided funds to buy a farm for more extensive work with farm animals. The rôle of inbreeding in the development of certain breeds of cattle is being studied and the influence of this practice on certain hereditary defects of horses is being noted. The inheritance of colour, hernia and other characters of swine is being studied and data on fertility, litter size and other aspects of the physiology of reproduction are being compiled. With sheep, colour inheritance and fertility are being studied. The influence of the thyroid on the growth of the fleece is being studied as is also the possibility of using anterior pituitary to induce oestrus at another period than that at which it normally occurs. A genetic study of the inheritance of kemp and of the possibility of eliminating it is also under way.

As was stated previously, passing mention can only be made of certain of the institutions concerned with animal research in Great Britain. There are many others carrying on investigational work and contributing to improvement in livestock production but these can only be referred to collectively. Sufficient has been said to convey some idea of the organization and type of institution functioning in that part of the British Empire and to suggest the nature of the research being conducted.

In conclusion, it would appear to the writer that the high lights of animal research in Great Britain are: (1) the organization of Institutes with departments for research in the various biological sciences; (2) team-work within the institutions in an effort to make a comprehensive study of a major project; and (3) close co-operation between institutions which are working on more or less related problems.

Great Britain with its herds, flocks, pastures and institutions of animal research offers a virgin field for exploration by the Dominion and Colonial animal husbandman. Those who have not had the opportunity of visiting this Mecca of the livestock man have a great pleasure in store.

THE EFFECT OF FERTILIZERS ON THE YIELD AND COMPOSITION OF CROPS FROM THE WOODED SOILS OF ALBERTA[1]

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Introduction

The podsolic wooded soils of Alberta have failed to produce satisfactory yields, especially with the grain crops, by reason of their low, natural state of fertility. Only by increasing the supply of plant nutrients in these soils will it become possible for them to produce yields which will justify their development. That satisfactory yields are possible is indicated by the experimental work with fertilizers and crop rotations which has been conducted by the Department of Soils of the University of Alberta. The material that is presented in this paper is a report of the 1932 yields obtained on the Breton Experimental Field, which is located on typical wooded soil. In addition, analytical data for the various crops is also submitted, which will show the effects of the fertilizers on the composition of the plants and the removal of plant nutrients from the soil.

Experimental

The experimental work conducted on the Breton field includes the use of fertilizers on various legumes and grains and on a four-year rotation of wheat, oats, barley and clover. The clover crop is nursed in the barley and plowed down as a green manure crop the next year. The following fertilizer treatments, except lime and manure, are applied annually to the rotation.

Plot	1	O	Check.
"	2	M	Manure, 22 tons per acre.
"	3	N P K	Complete, 100 lbs. Ammonium phosphate plus 50 lbs. KCl per acre.
"	4	N	Nitro-chalk (16% N) 120 lbs. per acre.
"	5	O	Check.
"	6	L	Lime, in the form of marl, 1100 lbs. per acre.
"	7	L P	Lime, as above, plus Triple Superphosphate at 120 lbs. per acre.
"	8	P	Triple Superphosphate, 120 lbs. per acre.
"	9	M P	Manure, 22 tons per acre plus Triple Superphosphate, 120 lbs. per acre.
"	10	N P	Ammonium phosphate, 100 lbs. per acre.
"	11	O	Check.

Lime was applied to all rotation crops in 1931, but only on the clovers and nurse crop in 1932. Manure was applied in 1930, the next application being on the cereals in 1932. The fertilizer applications to the other crops grown will be indicated in their yield tables.

The analysis submitted is of crops from 65 different plots on the Breton field. Nitrogen was determined by official methods (*1*). Phosphorus was determined by the colorimetric method developed by Truog (*3*) using stannous

[1] This paper was constructed from a thesis submitted to the University of Alberta in partial fulfilment of the requirements for the degree of Master of Science.

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chloride as a reducing agent. The samples were first moistened with 10% calcium acetate solution, dried, and ignited at 700° C. for 3 hours. They were then digested in dilute HCl, and made up to volume, aliquots being read. All samples are reported on an air dry basis, as no significant variations were found in moisture content.

Oats, Breton, 1932

The oat yields in Table 1 are quite typical of the district and indicate a relatively light yield of grain, with straw yields being very low. Definite increases have been obtained by the use of fertilizers, but yields are still not satisfactory. The low yields, and the high percentage of grain in relation to straw, suggest that nitrogen may be limiting vegetative growth, and it is found that the largest and most significant increases in yield have been obtained from applications of nitrogen, and nitrogen plus phosphorus. The lime plus phosphorus application shows some increase and the rest of the fertilizers show very little. Nitrogen is apparently the most limiting factor.

Table 1.—*Yields and composition of oats (1932) following wheat (1931). Series A. Breton*

Plot No.	Treatment	Yield per acre			Per cent composition air dry basis			
		Grain Bus.	Straw Lbs.	Total Lbs.	Grain		Straw	
					N	P	N	P
1	O	33.2	1255	2384	1.17	.364	.17	.082
2	M	32.8	1170	2285	1.35	.422	.21	.265
3	N P K	37.2	1560	2825	1.16	.369	.17	.120
4	N	50.0	2135	3835	1.14	.367	.17	.072
5	O	27.6	950	1888	1.32	.438	.20	.233
6	L	33.4	1195	2331	1.23	.407	.20	.168
7	L P	40.5	1455	1832	1.26	.378	.19	.138
8	P	34.6	1320	2496	1.24	.392	.19	.179
9	M P	36.9	1270	2525	1.47	.416	.24	.383
10	N P	46.5	1930	3511	1.26	.380	.18	.196
11	O	39.6	1510	2856	1.31	.397	.19	.177

Table 2.—*Yields and composition of barley (1932) following barley* (1931). Series D. Breton*

Plot No.	Treatment	Yield per acre			Per cent composition air dry basis			
		Grain Bus.	Straw Lbs.	Total Lbs.	Grain		Straw	
					N	P	N	P
1	O	15.6	735	1484	1.25	.397	.25	.098
2	M	22.0	1130	2186	1.51	.489	.25	.147
3	N P K	24.7	1740	2926	1.16	.407	.24	.079
4	N	26.8	1490	2776	1.10	.399	.24	.063
5	O	17.5	940	1780	1.41	.419	.29	.123
6	L	18.3	975	1853	1.26	.356	.24	.093
7	L P	21.4	1500	2527	1.29	.401	.25	.086
8	P	16.5	790	1582	1.36	.439	.27	.146
9	M P	27.9	1315	2654	1.50	.455	.27	.176
10	N P	27.6	1410	2735	1.41	.403	.25	.139
11	O	23.3	1145	2263	1.40	.411	.25	.142

* Barley sown in place of oats in 1931.

Composition of the Oat Crop.—The percentage of nitrogen in the oat grain is low enough to seriously impair its feeding value. The content varies, with the different treatments, from 57% to 74% of the normal content (1.98%) given by Henry and Morrison (2). The lowest percentage of nitrogen was found in the grain from Plot 4, which received the largest amount of that element. The complete plot also gave grain low in nitrogen. Except for the applications of manure which produced grain of the highest nitrogen content, the rest of the fertilizers show little effect. The fluctuations in the percentage of nitrogen in the straw from these plots, follow very closely the variations in the grain. They are, however, even more seriously lacking in nitrogen than the grains, for a normal content is .58% (2) and they range from .17% to .24%.

Unlike nitrogen, phosphorus is found to be considerably above normal in this oat crop, especially in the straw. A normal content of phosphorus may be placed at .33% for grain and .082% for straw. Grain with the lowest content comes from the nitrogen plot and that with the highest content from the manure plots, but none of the variations are very outstanding.

Barley, Breton, 1932

This crop may be considered as an example of straight grain farming, for the rotation has not been established long enough for a green manure crop to have preceded this barley. The data in Table 2 indicate a relatively light crop of barley in spite of the increases obtained by the fertilizers. The larger increases in yield are from the plots receiving nitrogen; i.e. Plots 3, 4 and 10. The plots which received manure also show fair increases. Phosphorus or lime alone gave no increases, but they did slightly when in combination. As in the oat crop nitrogen is again the limiting factor.

Composition of the Barley Crop.—The fluctuations in the nitrogen content of the barley grain are much the same as in the oats. Manure applications have given the highest nitrogen contents, while the lowest percentages are in the crops receiving nitrogen alone and the complete fertilizer. The rest of the fertilizers have had, if anything, a slightly depressing effect on the nitrogen content. The percentage of nitrogen in the straw varies similarly with that of the grain. In spite of the variations present, all of the barley from this Series is below normal in protein. From the standpoint of a feed this is a disadvantage, but in the brewing industry it is desirable. The Canada Malting and Brewing Company have tested plot samples of this barley and consider them excellent for brewing purposes. The protein content of the straw is half of normal straw.

The phosphorus content of the grain is considerably over the normal of .34% and several of the plots yield straw about twice the average, .072%. The applications of phosphorus and manure, alone or in combination, show the largest increase in phosphorus content. Lime has tended to depress the phosphorus content, while the rest of the fertilizers have had little effect.

Clover in Rotation, Breton, 1932

On these wooded soils the response to fertilization is much greater from a legume crop than from a cereal crop. From the yields submitted in Table 3 it is evident that untreated clover crops are quite low yielding and that good yields may be obtained by fertilizers. All the plots that received phosphorus,

alone or in combination, have given yields which are two and three times greater than the checks. Nitrogen and lime show substantial increases but the manure gave only a slight increase.

This clover was a mixture of alsike and white sweet clover and outstanding differences in the relative amounts of each clover were due the different treatments. On the checks and manure plots the sweet clover did very poorly, the bulk of the crop being alsike. The lime stimulated both clovers, especially the sweet clover, while the complete fertilizer favored the alsike. All the other plots had strong stands of both clovers with the sweet clover predominating.

Composition of the Clover Crop.—The percentages of nitrogen (Table 3) of all the clover crops, except that receiving complete fertilizer, are about normal. The complete fertilizer has increased the nitrogen content about 50%. As this plot received the same amount of nitrogen and phosphorus as Plot 10 it would appear that potassium has had a marked effect. During growth Plot 3 had a much darker color than the rest of this Series.

TABLE 3.—*Yields and composition of clover. 1932. Series C. Breton.*

Plot No.	Treatment	Yield per acre (lbs.)	Per cent composition air dry basis		
			N	P	Ca
1	O	1225	2.02	.316	1.55
2	M	1665	2.07	.285	1.43
3	N P K	4395	3.02	.283	1.14
4	N	3160	2.16	.237	1.43
5	O	1390	2.14	.280	1.48
6	L	3835	2.01	.244	1.42
7	L P	4515	2.31	.304	1.43
8	P	4230	2.18	.314	1.20
9	M P	4510	2.21	.328	1.42
10	N P	4220	2.26	.314	1.34
11	O	2490	1.99	.301	1.50

A normal phosphorus content for these clovers ranges between .25% and .28%. Thus all the plots, except those receiving only nitrogen and lime, are normal or slightly above normal in the amount of phosphorus they contain. Nitrogen and lime have slightly depressed that element.

The calcium contents of the clovers, as a whole, are close to normal. The crops from the complete and phosphorus plots are a little on the low side while the checks are the highest. The addition of lime has had no distinct effect on the calcium content of the crop.

WHEAT, BRETON, 1932

The benefits of rotation coupled with the combined use of green manures and fertilizers are well demonstrated in the yields which have been obtained on Series B (see Table 4). This crop immediately follows a green manure crop, and during all its growing season was outstandingly heavier and healthier than any other grain crop on the field. Yields have been increased from 11.4 bushels per acre, which is an ordinary wheat yield for the district, to the very satisfactory yield of 45.9 bushels.

TABLE 4.—*Yields and composition of wheat (1932) following clovers turned under (1931). Series B. Breton.*

Plot No.	Treatment	Lbs. of Green manure per acre	Yield per acre			Per cent composition air dry basis			
			Grain Bus.	Straw Lbs.	Total Lbs.	Grain		Straw	
						N	P	N	P
1	O	2197	21.4	1850	3134	2.68	.455	.57	.273
2	M	2208	28.3	2780	4478	2.13	.480	.27	.096
3	N P K	3822	43.1	4280	6866	2.16	.391	.30	.034
4	N	5140	22.6	2020	3376	2.80	.518	.53	.169
5	O	1278	17.0	1130	2150	2.69	.480	.52	.204
6	L	3574	26.3	2195	3773	2.35	.490	.38	.154
7	L P	4087	36.6	3325	5521	2.25	.435	.27	.081
8	P	4055	30.2	2930	4742	2.31	.461	.29	.082
9	M P	4047	45.9	4250	7004	2.33	.460	.29	.110
10	N P	3734	34.7	3165	5247	2.65	.521	.35	.121
11	O	2291	19.8	1590	2778	2.87	.490	.61	.275
Wheat (1932) following clovers all removed (1931). Series F, Breton.									
1	O	None	11.4	920	1604	2.71	.505	...	....
3	N P K	Plowed	25.6	2315	3851	2.12	.460	...	....
4	N	Down	15.6	1340	2276	2.81	.494	...	....

These large increases are due to the combined effects of clover and fertilizers. The increase that was obtained by just the use of clover and no fertilizer is indicated by the 10 bushel increase on Plot 1B over Plot 1F. Series F had no clover plowed down for the clover crop was allowed to ripen and then removed. The fertilizers had a double opportunity of increasing yields, for besides supplying plant food, they also increased the amounts of green manure the previous year. It will be noted that all the plots that received phosphorus are among the high yielders, the manure plus phosphorus and the complete fertilizer yielding the highest. A fair response was obtained from the use of lime or manure alone, but nitrogen even with the large amount of clover plowed down did not significantly increase the yield.

Composition of the Wheat Crop.—The analysis of the wheat shows no lack of nitrogen as was the case in the oats and barley. On both Series B and F, the grain from the checks, the ammonium phosphate plot and the plots receiving nitrogen alone, are slightly above normal in protein, while the complete fertilizer and the manure plot show a slight depression. The rest of the crops are about normal. The straw, however, of the higher yielding plots is about 50% below the normal content of .5%, the checks being about average. The phosphorus content of all the grains, except from the complete are somewhat above the average of .49%, some are as much as 25% higher. There is a large degree of fluctuation in the percentage of phosphorus in the straw. An average content of .08% indicates several crops with over twice this amount. The percentage of phosphorus in the straw shows a strong relationship to the stage of maturity, due likely to translocation.

OTHER LEGUMES, BRETON, 1932

Series F and H, were summer-fallowed the year before they were sown to legumes, and indicate that very good initial crops may be obtained by

this practice, even without the use of fertilizers. Yields of approximately 2 tons per acre for untreated alfalfa and alsike are considered very good. The effects of the fertilizers in increasing yields in these cases are not as outstanding but they generally give small increases. Older stands of legumes, such as the red clover, yield much lower on their check plots, and their yields are more than doubled by fertilization. The mixture of western rye and alsike, also an old stand, shows very low check yields with fertilized plots yielding from 2 to 5 times greater crops.

TABLE 5.—*Other legumes, Breton, 1932.*

Crop	Treatment, lbs. per acre	Yield lbs. per acre	Per cent composition	
			N	P
	Check	3980	2.39	.184
Alfalfa	Marl 1200	3445	2.34	.207
Series H	Marl 1200 + Amm. Phos. 100	4400	2.39	.228
	Amm. Phos. 100	3755	2.43	.240
Sweet	Check	2252	2.48	.275
Clover	Marl 1200	2855	2.26	.260
Series H	Marl 1200 + Amm. Phos. 100	3525	2.77	.296
	Amm. Phos. 100	3880	2.67	.286
Alsike	Check	4330	2.09	.285
Clover	Marl 1200	4660	2.11	.236
Series H	Marl. 1200 + Amm. Phos. 100	4860	1.91	.283
	Amm. Phos. 100	5265	2.35	.318
Alsike	Check	3850	1.93	.269
Clover	Triple Superphos. 120	4230	2.26	.296
Series F	Amm. Phos. 100	4860	1.88	.326
Red	Check	1330	1.77	.255
Clover	Triple Superphos. 120	3485	1.81	.246
Series G	Amm. Phos. 100	2560	1.77	....
	Check 5	803	2.11	.406
Alsike &	Check 11	935	2.29	.477
Western	Amm. Phos. 100	1740	1.94	.361
Rye Hay	Triple Superphos. 120	1975	1.94	.309
Mixture	Nitro-chalk 120	2835	1.97	.281
	Complete 150	4520	1.64	.254

Composition of the Legumes.—Considering the legumes of Series F and H, the application of ammonium phosphate has tended to increase slightly the percentage of phosphorus in the crop, and sometimes to increase slightly the nitrogen. The marl has had no distinct effect on composition. As a whole these legumes are above normal in phosphorus, and close to an average nitrogen content. The effects of the fertilizers on the mixture of alsike and western rye are very outstanding. All the fertilizers causing large increases in yield have greatly depressed the phosphorus and nitrogen content. The phosphorus content of these check crops is almost twice normal. The nitrogen content is fairly good in the checks of this hay mixture, but has been considerably lowered on the higher yielding plots.

Discussion

It has been indicated that cereal crops grown on podsolic wooded soils are primarily limited by lack of nitrogen and that following a green manure crop yields increase substantially with greater response being obtained from fertilizers. Table 6 shows the relative amounts of nitrogen and phosphorus utilized by the different crops and supplied by the different fertilizers. It will immediately be noted that the clover of 1931 on Series B supplied amounts of nitrogen which, except on Plot 5, were larger than the amounts removed by the following wheat crop, and are several times larger than the amounts supplied by the fertilizers. When no fertilizers were used, one ton of green manure (dry wt.) supplies sufficient nitrogen (not considering any losses) for the wheat crop the next year, and (by Plot 4) no further significant increase is obtained by more nitrogen. With the application of phosphorus (Plot 10) even with less nitrogen than on Plot 4, the yield increases from 22.6 to 34.7 bushels. By the addition of potassium on Plot 3, where there is apparently still less nitrogen but approximately the same amount of phosphorus, the yield reaches 43.1 bushels. This would appear to indicate that in order of scarcity, nitrogen, phosphorus and potassium are all necessary on these soils if satisfactory yields are to be obtained. Further evidence that phosphorus is not primarily limiting is shown by the very high ratio of phosphorus to nitrogen in the oats and barley; a ratio of 1:5 being close to normal. It will also be noted there has been very low utilization of the phosphorus applied to the cereals, but a fairly good utilization when applied to the legumes. An untreated clover crop uses slightly less phosphorus than an untreated grain crop, but the wheat crop following the green manure uses almost twice the amount. This method of green manuring without phosphorus would hasten depletion of that element in the soil.

Regarding the effect of fertilizers on composition it may be said that the fertilizers giving the larger increases, such as those from nitrogen on the barley

Table 6.—*Removal of nitrogen and phosphorus (lbs.) per acre by different crops.*

Plot No.	Treatment	Series A Oats (1932)		Series D Barley (1932)		Series C Clover (1932)		Series B Wheat (1932)		Series B Clover (1931)	Supplied by fertilizers	
		N	P	N	P	N	P	N	P	N	N	P
1	O	15.3	5.1	11.2	3.7	24.7	3.9	45.0	10.9	46.5		
2	M	17.5	7.8	18.8	6.8	34.5	4.7	43.7	10.8	64.0		
3	N P K	17.3	6.6	17.9	6.2	132.7	12.3	68.7	11.6	76.8	10	20
4	N	23.0	7.7	17.7	6.1	68.3	7.5	48.7	10.4	111.5	20	
5	O	14.3	6.3	14.6	4.7	29.7	3.9	33.3	7.2	23.1		
6	L	16.4	6.6	13.4	4.0	77.1	9.4	45.4	11.1	64.0		
7	L P	20.1	7.2	17.0	5.4	104.3	13.7	58.4	12.2	94.8		25
8	P	17.1	7.0	12.9	4.6	92.2	13.3	50.4	10.8	91.2		25
9	M P	21.5	10.1	23.6	8.4	99.7	14.8	76.5	17.4	91.9		25
10	N P	23.4	9.8	22.2	7.3	95.4	13.3	66.3	14.7	89.2	10	20
11	O	20.5	8.1	18.5	6.2	49.6	7.5	43.8	10.2	47.7		
Ave. Removal		18.7	7.5	17.1	5.8	73.5	9.5	52.7	11.5	72.8		
Ratio of N to P		2.5:1		2.9:1		7.7:1		4.6:1				

and oats, phosphorus on the red clover or any of the fertilizers on the alsike and western rye mixture, are accompanied by a lowering of their content in the crop. On the other hand where increases were not large, as experienced by the phosphorus applied to the legumes of Series H or to the barley, the element tended to accumulate in the plant. As a general rule the content of nitrogen and phosphorus in the cereals was closely and inversely related to yield, and any increase in the total produce of one plot over another lowered the nitrogen and phosphorus content. With the legumes the nitrogen percentage generally increased with the yield, due probably to greater fixation.

SUMMARY

1. The yields and composition of various crops grown on the podsolic wooded soils of Alberta with various fertilizers are reported.

2. The use of green manure legume crops with fertilizers gave increases in wheat yields up to four times that of the checks.

3. Generally where relatively large increases in yield were obtained by fertilizers, the nitrogen and phosphorus contents were reduced, an exception being the nitrogen content of clover which often increased with yield.

4. Oat and barley crops were seriously below normal in protein content whether fertilized or not.

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CURRENT PUBLICATIONS

REPORT OF THE ROYAL COMMISSION ON BANKING AND CURRENCY IN CANADA, 1933. J. O. Patenaude, King's Printer, Ottawa. Price, 50 cents.

The whole problem with which the Commission had to deal may be summarized as follows: What is the general economic position of Canada? Are the existing banking and financial mechanisms adequately equipped to cope with the monetary and financial problems to which such situation gives rise?

After a complete survey of the situation, the Commission by a majority recommended that a central bank for Canada be forthwith established, and unanimously recommended that an inquiry be instituted by the Dominion Government, preferably with the co-operation of the Provincial Governments, to investigate the existing organizations for the provision of rural credit with a view to the preparation of a scheme for the consideration of Parliament.

In the last paragraph of the chapter dealing with rural credit, the Commission stated that the material available on this subject during the course of the inquiry was not sufficient to enable it to make a specific recommendation as to the precise form which such an organization might take. Evidence presented satisfied the Commission that the need for such an agency is a real one. Agriculturists will receive with special interest the recommendation regarding the organization of an adequate rural credit system in Canada.

BUNT INFECTION OF SPRING WHEAT BY SOIL-BORNE SPORES[1]

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In a recent paper (*1*) the writers reported that spores of the bunt-fungus, *Tilletia tritici* (Bjerk.) Wint., which had overwintered in infected wheat-heads lying on the surface of the ground were capable of varying degrees of germination the following spring, whereas those which had overwintered in buried heads were less viable.

This experiment was repeated in the winter of 1932-33. Heads of Mindum wheat infected with *T. tritici* were sent in October, 1932, to the following places: Morden, Man., Brandon, Man., Indian Head, Sask., Saskatoon, Sask., and Edmonton, Alta. Some of these heads were placed to overwinter on the surface of stubble-land, and others were buried about six inches below the surface. Bunted heads of Mindum wheat were allowed to overwinter in the same way at Winnipeg. In the spring of 1933, when wheat seeding had begun, the bunted heads were collected and sent to the laboratory at Winnipeg for tests of spore-germination. The results of the germination tests are summarized in Table 1.

TABLE 1.—GERMINATION TESTS OF BUNT-SPORES OVERWINTERING IN INFECTED WHEAT-HEADS IN WESTERN CANADA. (1932-33).

Station	Germination	
	Heads placed on surface of ground	Heads buried 6 inches
Winnipeg	low	low
Brandon	medium	"
Morden	"	"
Indian Head	"	"
Saskatoon	high	"
Edmonton	"	medium

As in the 1931-32 experiment, the spores which had overwintered in heads placed on the surface of the ground were capable of varying degrees of germination. Those from Saskatoon and Edmonton germinated as abundantly as spores from heads which had been stored in the laboratory at Winnipeg. With the exception of the Winnipeg collection, the spores which had overwintered in buried heads were less viable than those which had overwintered on the surface of the ground.

An experiment was made also to determine the capacity for infection of overwintering bunt-spores. On October 13, 1932, spores of *T. tritici* which had been sifted through a 200-mesh sieve were scattered over the surface of a plot four feet square situated near the laboratory. Two other plots of the

[1] Contribution from the Division of Botany, Experimental Farms Branch, Department of Agriculture, Ottawa.

Cooperative experiment made by the Dominion Rust Research Laboratory, Winnipeg, the Dominion Laboratories of Plant Pathology at Saskatoon and Edmonton, and the Dominion Experimental Farms at Morden, Brandon, and Indian Head.

[2] Senior Plant Pathologist, and Assistant Plant Pathologist respectively.

same size were inoculated in the same manner, one with bunt-balls of *T. tritici*, and the other with bunted heads infected with this species. The inoculum on each of the three plots was then well mixed with the surface layer of soil.

During the winter the plots became buried in snow. Early in the spring of 1932, after the snow had melted, they were covered with water for several days. Records of the soil-temperatures prevailing throughout the winter were not kept. At the Manitoba Agricultural College, however, the lowest air-temperature recorded during the winter of 1932-33 was –42° F.

On April 25, 1933, formalin-treated seed of Ceres wheat, a susceptible variety, was sown on each of the plots. A fourth plot nearby, which had not received any inoculum, was likewise sown with Ceres wheat as a control.

When the wheat growing on the four plots had ripened, it was examined for bunt-infection, and counts were made of the number of infected heads in each plot.

Eleven bunted heads were found in the plot which had received sifted bunt-spores; 29 in the plot which had received bunt-balls; and 45 in the plot which had received bunted heads. No infected heads were found in the control plot. Some of the infected heads found in the two plots which had received either bunt-balls or bunted heads were borne on volunteer plants of Mindum and Reward. These plants grew from sound kernels in partially bunted heads of the varieties which had been used as inoculum.

It is apparent that under the conditions of these experiments some of the bunt-spores overwintered successfully and were capable of causing infection the following spring. Judging by the relative amounts of infection in the three inoculated plots, spores which overwinter in bunted heads are more likely to retain their viability than those which overwinter in direct contact with the soil.

The degree of infection in all of the plots was relatively light when considered in relation to the quantity of inoculum applied to them. Hence, it is probable that only a small proportion of the spores retained their viability until the spring. This conclusion is supported by the results of the germination tests with spores overwintering in the field at Winnipeg, as given in Table 1.

Summary

1. The results of germination tests of bunt-spores (*Tilletia tritici*) which had overwintered in the field in 1932-33 were similar to those of the preceding year. Spores from infected heads of Mindum wheat overwintering on the surface of the ground germinated better than those from buried heads.

2. In the fall of 1932, bunted heads, bunt-balls, and sifted bunt-spores were applied to each of three plots. Formalin-treated Ceres wheat sown on these plots in the spring of 1933 produced a number of bunted plants. Some of the volunteer plants growing on the plots which received bunted heads and bunt-balls were also infected.

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THE ECONOMIC ANNALIST

A REVIEW OF AGRICULTURAL BUSINESS PREPARED QUARTERLY BY THE AGRICULTURAL ECONOMICS BRANCH, DEPARTMENT OF AGRICULTURE, OTTAWA

Vol. III. Nos. 10, 11, 12. Oct., Nov., Dec., 1933

THE ECONOMIC SITUATION

PREPARED IN THE AGRICULTURAL ECONOMICS BRANCH, DEPARTMENT OF AGRICULTURE, OTTAWA, FROM BASIC DATA COLLECTED BY THE DOMINION BUREAU OF STATISTICS

An upturn was registered in wholesale prices in Canada during November. The index number computed by the Dominion Bureau of Statistics was, therefore, 68.7 as compared with 67.9 in October. Gains were recorded in the vegetable products group, animals and their products, wood, wood products and paper, iron and its products, and non-ferrous metals and their products. Fibres, textiles and textile products, non-metallic minerals and their products, and chemicals and allied products declined.

Retail Prices. The index of retail prices, rents and costs of services rose from 77.9 in October to 78.1 in November. The advance was largely due to increased prices in the food group and, to a lesser degree, to an advance in the fuel index.

Employment. The index of employment advanced from 88.4 at the first of November to 90.9 at the first of December. This is 8 points above the index as at December 1st, 1932.

Physical Volume of Business. The index number of physical volume of business receded to 85.5 in November. Industrial production dropped from 87.4 to 83.9. The index of manufacturing eased downward from 87.9 to 86.2. The forestry index on the other hand advanced from 86.2 to 87.2. Iron and steel production fell from 37.3 to 33.4. The construction index declined from 42.6 to 37.3. Electric power production advanced from 148.8 to 158.1. Imports were higher but the export index declined.

Agricultural Products. Prices of Canadian farm products advanced in November. The index of field products rose from 44.6 to 46.7. The index of animal products rose from 62.8 to 65.8. The total index thus moved up from 51.4 in October to 53.8 in November. The average closing price of No. 1 Manitoba Northern wheat at Fort William was 60.5 cents per bushel in October as compared with 63.7 cents in November. Prices of barley, oats, flax and rye were somewhat higher. Better prices were obtained for cattle, hogs, sheep, lambs, milk, eggs and wool, and caused the index of animals and animal products to rise three points. While prices of farm products are still very low, it will be observed that on the whole the trend has been upward in 1933.

Agricultural marketings were much below those in October. The index of grain marketings dropped from 70.0 to 36.7, the wheat index fell from 75.6 to 40.1, oats from 97.2 to 35.9. Relatively little barley, flax or rye moved. The total index thus fell from 70.5 in October to 41.8 in November.

Livestock marketings held up better than those of grain. The index of cattle marketings declined from 56.2 to 50.7. Hogs dropped from 93.6 to 88.0. Sheep marketings declined from 98.8 to 61.7. There was quite a reduction in the movement of calves, the index falling from 102.8 in October to 89.9 in November. The total index, therefore, dropped to 41.8.

The index of cold storage holdings was slightly lower in November. Stocks of eggs, lard, and cheese were higher than in October but those of other commodities were lower than in the previous month. The most notable change was reported in mutton supplies.

ANNUAL AND MONTHLY INDEX NUMBERS OF PRICES AND PRODUCTION
COMPUTED BY DOMINION BUREAU OF STATISTICS

Year	Wholesale Prices 1926 = 100				Retail prices and cost of services (5)	Production (6) 1926 = 100			
	All commodities (1)	Farm products (2)	Field products (3)	Animal products (4)		Physical volume of business	Industrial production	Agricultural marketings	Cold Storage holdings
1913....	64.0	62.6	56.4	77.0	65.4	....	....	....	....
1914....	65.5	69.2	64.9	79.0	66.0	....	....	....	....
1915....	70.4	77.7	76.9	79.2	67.3	....	....	....	....
1916....	84.3	89.7	88.4	92.3	72.5	....	....	....	....
1917....	114.3	130.0	134.3	119.6	85.6	....	....	....	....
1918....	127.4	132.9	132.0	134.7	97.4	....	....	....	....
1919....	134.0	145.5	142.4	152.5	107.2	71.3	65.5	48.1	47.1
1920....	155.9	161.6	166.5	149.9	124.2	75.0	69.9	52.6	94.2
1921....	110.0	102.8	100.3	108.5	109.2	66.5	60.4	65.2	86.4
1922....	97.3	86.7	81.3	99.1	100.0	79.1	76.9	82.6	82.6
1923....	98.0	79.8	73.3	95.1	100.0	85.5	83.8	91.4	87.8
1924....	99.4	87.0	82.6	97.2	98.0	84.6	82.4	102.5	114.6
1925....	102.6	100.4	98.1	105.7	99.3	90.9	89.7	97.2	108.9
1926....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1927....	97.7	102.1	99.9	105.7	98.4	106.1	105.6	103.6	110.0
1928....	96.4	100.7	92.6	114.3	98.9	117.3	117.8	146.7	112.8
1929....	95.6	100.8	93.8	112.5	99.9	125.5	127.4	101.1	109.6
1930....	86.6	82.3	70.0	102.9	99.2	109.5	108.0	103.0	128.4
1931....	72.2	56.3	43.6	77.6	89.6	93.5	90.4	99.0	125.7
1932....	66.7	48.4	41.1	60.7	81.4	78.7	74.0	114.3	120.1
1933									
Jan.....	63.9	43.6	35.1	57.9	79.1	68.1	62.2	56.1	112.0
Feb.....	63.6	43.0	36.0	54.7	78.4	67.0	60.9	76.5	127.6
Mar.....	64.4	44.7	38.0	56.0	77.8	68.4	62.5	129.0	135.8
April...	65.4	46.8	41.1	56.4	78.1	69.8	65.1	104.1	112.7
May....	66.9	51.2	46.9	58.4	77.0	76.4	72.7	95.4	100.4
June....	67.6	52.6	49.4	57.9	77.0	82.2	79.8	221.9	119.9
July....	70.5	60.1	60.8	59.0	77.2	84.1	82.6	136.3	114.5
Aug.....	69.4	57.0	54.9	60.5	78.6	89.8	89.5	197.2	114.2
Sept....	68.9	54.7	49.5	63.4	78.8	90.8	90.2	101.1	115.7
Oct.....	67.9	51.4	44.6	62.8	77.9	88.2	87.4	70.5	112.7
Nov....	68.7	53.8	46.7	65.8	78.1	85.5	83.9	41.8	111.1

1. See Prices and Price Indexes 1913-1928, pp. 19-21, 270-289 and 1913-1931, p. 15

2. Wholesale prices of Canadian products of farm origin only. See Prices and Price Indexes 1913-1931, p. 33, and Monthly Mimeographs 1932 and 1933.

3. Wholesale prices of grains, fruits and vegetables.

4. Wholesale prices of Animals and Animal Products.

5. Including foods, rents, fuel, clothing and sundries, See Prices and Price Indexes 1913-1928, pp. 181-185, 290-293. 1926 = 100.

Prices and Price Indexes 1913-1931, pp. 122, and Monthly Mimeographs 1932-1933.

6. Monthly Review of Business Statistics, pp. 8, and Monthly Indexes of the Physical volume of business in Canada, supplement to the Monthly Review of Business Statistics, November, 1932.

Field Crops. The Agricultural Branch of the Dominion Bureau of Statistics recently released its annual statement of the area sown to field crops. It is interesting to note that there was a reduction of over a million acres in the total. The area sown in 1932 was 57,734,000 acres while in 1933, 56,580,550 acres were planted. Total wheat acreage was reduced from 27,182,000 acres to 25,991,100 acres. The acreage in oats increased from 13,148,400 acres in 1932 to 13,528,900 in 1933. Barley on the other hand occupied 3,757,600 acres in 1932 and 3,658,000 acres this year. There was a considerable reduction in the acreage of rye, the figure for 1932 was 773,800 while 583,100 acres were sown in 1933. Acreage in flax was also lower in 1933 when 243,600 acres were sown as against 453,700 acres in 1932. There has been a substantial increase in the acreage of alfalfa. Changes in acreage of other crops are not large.

Yields per acre of crops given above were as follows: wheat 15.8 bushels in 1932 as against 10.5 in 1933, oats 29.8 and 23 bushels for the respective years, barley 21.5 and 17.4, rye 11.6 and 8.1, flax seed 5.4 and 2.8, mixed grains 33.0 and 28.4 bushels per acre.

The value of field crops was estimated to be $432,199,400 in 1931, as against $444,894,900 in 1932, and $427,791,000 in 1933. The average estimated values were as follows: wheat 35 cents per bushel in 1932 and 45 cents in 1933; oats 19 cents and 25 cents respectively; barley 23 and 26; rye 27 and 34; flax seed 62 and $1.12; and mixed grains 33 cents and 39 cents. These figures are of course preliminary.

Numbers of Live Stock. The Bureau reports that the number of horses on farms declined in 1933. Cattle numbers increased. Sheep and swine are fewer this year than last. There has been a drastic reduction in the number of hens and chickens but other kinds of poultry have increased.

Live Stock Marketings. According to the Live Stock Market Report, December 21st, cattle marketed during 51 weeks of 1933 numbered 590,467 as compared with 563,636 during the same period of 1932. Calf marketings in the same periods were 312,522 and 298,269 respectively. Marketings of sheep were 464,058 in 1933 and 463,010 in 1932. Hogs marketed at public yards and direct to packing plants numbered 3,087,582 this year as compared with 3,056,119 during 1932.

Butter Production. For the ten months ending October 31st, butter production in Canada is reported by the Federal Dairy Branch to have been 195,237,239 pounds as compared with 190,018,592 pounds in the same period of 1932, an increase of 2.7%. Production decreased in Prince Edward Island, New Brunswick, Quebec and British Columbia but increased in the other provinces. Alberta had the highest increase amounting to 13.3% over 1932 and Saskatchewan had the second largest increase, 10.4%.

Cheese Gradings. Boxes of cheese graded during the period November 28, 1932 to December 2nd, 1933 numbered 1,171,034 as against 1,296,444 boxes in approximately the previous twelve month period.

Apples and Potatoes. Commercial apple production as estimated by the Fruit Branch has been placed at 4,892,000 bbls. in 1933 as against 3,977,000 in 1932. The potato crop was placed at 527,700 acres in 1933 as against 521,500 acres in 1932. The yield was estimated to be 41,542,000 cwts. this year as compared with 39,416,000 cwts. in 1932.

AUSTRALIA PLANS NEW MARKETING METHODS TO COMPLY WITH WORLD WHEAT AGREEMENT

According to a recent article in "Foreign Crops and Markets" no legislation will be necessary in Australia to ensure compliance with the International Wheat Agreement. A proclamation will be issued prohibiting export of grain or flour except under permit. All exporters will require licences, and will be allotted definite export quotas based on previous volumes handled. Licences to export will be subject to conditions. "Each licenced exporter will be required to undertake to buy from farmers, as long as they are freely offering wheat for sale, or to hold for farmers and make advances in respect thereof, one bushel of wheat for every two bushels which he is entitled to export during the year from August 1, 1933, to July 31, 1934". Exporters who purchase more than they can export during this period will be permitted to export freely the following year but such carryover amounts will be taken into consideration in determining the individual export quotas for 1934-35. If merchants do not offer world parity for the whole of the exportable surplus of wheat the Commonwealth itself will purchase the wheat.

EFFORTS TO CONTROL MARKETING BY GOVERNMENT BOARDS OR ORGANIZATIONS ACTING WITH GOVERNMENT SUPPORT

Part II[1]

J. Coke[2]

In this article discussion of controlled marketing is continued. It is not the purpose of the author to discuss the relative merits of these schemes or to compare potential results with those secured under the usual method of marketing. It is rather to present available information on marketing plans adopted in various countries and on which readers may not readily be able to secure data.

The Bulgarian Cereal Monopoly.—The exercise of public monopoly control has become prevalent in some countries and particularly with respect to bread grains and tobacco.

In December, 1930 the Bulgarian Government established the Central Grain Purchasing Bureau. This Bureau was given power to purchase wheat and rye at fixed prices and began its operations in February, 1931. It used co-operative associations, banks and merchants as its agents and made payments to producers in cash and in taxation credits; the latter were redeemable prior to September 1st, 1931. It was thus a means of enabling the farmer to pay his taxes but it reduced the State income by an equivalent amount and at the same time added to the burdens of the Treasury[3]. At the outset payments for wheat were to be only twenty-five per cent in cash but fifty per cent in cash might be paid in the case of purchases of rye. The cash ratio was revised upward in August, 1931. The Bureau was given power to fix storage rates where it found it necessary to do so.

Funds were provided for its use through loans from the Agricultural Banks as well as the Co-operative Bank. Altogether its original loans amounted to $288,000. When the Bureau was established it was merely authorized to purchase wheat and rye at prices higher than those obtainable in world markets. Such prices were to be decided in conference with representatives of the Government, the banks, the co-operatives and the grain exchanges[4].

The Bureau paid prices above world parity, and consequently the amount of grain handled in the early months of operation was larger than anticipated and the prices paid were reduced. Nevertheless, after about eight months' operation it was found that the cash payments for grain exceeded the amount of sales and it was then decided that the Government should assume exclusive control. Accordingly, in October, 1931, a series of orders-in-council proclaimed this intention. The Central Grain Purchasing Bureau continued to administer the regulations. The Bureau thus became the sole buyer or seller of cereals in the country and it was also proclaimed to be unlawful for flour to be sold unless it had been made from wheat purchased from, or controlled by the Bureau. The milling industry was brought under the direct supervision of the Bureau. A controller was appointed for each large commercial mill and in cases where several small mills could be conveniently grouped these were placed under the direction of a single controller. It is the duty of the controller to audit the books and check all declarations. The salaries of these officers are collected by the Bureau out of funds contributed by the commercial mills. The custom mills were placed under the direction of the mayor of the municipality in which they are located, and it is necessary to secure a permit from him in order to grind wheat and rye.

In connection with sales, provision was made for compulsory registration of all export sales on the stock exchange located at the point of delivery for export. A brokerage

[1] See The Economic Analist, Vol. III, Nos. 7, 8 and 9, pp. 76-78; and Scientific Agriculture *14*: 76-78.

[2] Assistant Commissioner, Economics Branch, Department of Agriculture, Ottawa.

[3] Dolinsky, N. V. The agricultural situation in Bulgaria. Report to the International Conference of Agricultural Economists, 1933. Mimeographed, pp. 9-10.

[4] For a more complete statement see Edminster, L. R., Schaben, L. J., and Lynsky, M., F-S 56. Agricultural price supporting measures in foreign countries. Bureau of Agricultural Economics, U.S. Department of Agriculture, Washington, D.C., p. 44.

charge of 2% is to be paid to the exchange. Similarly, all sales for local consumption are to be registered on the Sofia Exchange and the brokerage charge in this case is 1%, which amount is redistributed among the exchanges on a proportionate basis.

Early in 1932 a special cartel or monopoly law was enacted which empowered the State to dissolve monoplies and to fix prices. Action has already been taken with respect to the sugar monopoly. Prices of flour, sugar, copper sulphite, sunflower seed oil and other products have been officially set .

Other countries have acquired monopoly control over certain cereals or other products; for example, Poland, France, Greece, Japan and Hungary. Germany has a quasi monopoly to control wheat marketing.

The Chadbourne Plan of Sugar Control.—Under this plan the principal sugar exporting countries entered into an agreement in May, 1931 to curtail exports of sugar. The countries concerned were Cuba, Java, Germany, Czecho-Slovakia, Poland, Hungary and Belgium. These countries represent about 40% of the world's output of sugar and approximately 90% of the exports. Peru and Jugo-Slavia joined in the agreement later in the year. The Chadbourne Plan not only limits exports to a quota but restricts production through the limitation of acreage. This scheme is administered by a permanent council known as the International Sugar Council with headquarters at the Hague. The objective has been to reduce sugar supplies gradually.

It was provided that the export quotas should be increased by 5% when the f.o.b. price of raw Cuban sugar should reach two cents per pound and maintain this level for thirty days. Further upward revision of export quotas was to be permitted as prices rose. An interesting arrangement was made whereby should Germany fail to export its quota in any year the shortage would be made up by an increase in exports from Cuba, Poland, Hungary and Czecho-Slovakia during the following year. Surplus stocks in each of the countries have been declared and these are to be reduced in annual installments.

The Chadbourne Plan has encountered some difficulties due to the decline in sugar consumption. The production of sugar has been curtailed but it is apparent that it has not yet been able to materially reduce accumulated stocks. It has, of course, three more years to demonstrate its effectiveness. The Cuban quota was revised upwards at a meeting of the Council in December, 1932 because of reduced exports to United States. The price level at which the first advance in quota can be made has been reduced to 1.75 cents f.o.b. Cuba, presumably because of the lower price quotations. This Plan has the support of the Governments of the countries concerned. It is, moreover, an attempt at international unity of action which is more difficult of accomplishment than national or regional unity.

The Paterson Stabilization Plan.—This plan has been applied in marketing Australian butter. It has been in operation since January 1, 1926. It had three objectives[6]: (1) to counteract the extra costs of production due to the accepted fiscal policy of Australia; (2) to aid in the disposal of surplus butter; (3) to stabilize butter prices in Australia. It should be stated that this scheme is a voluntary one and is administered by a Federal Stabilization Committee which is composed of representatives of both co-operative dairy marketing interests and private manufacturers. There is also an interstate committee with state branches. In 1926, under this arrangement, which is voluntary, a levy was made on all butter produced in factories in Australia except in the state of Western Australia. The amount of this levy was originally 1d. per pound but in 1928 it was raised to 1¾d. Out of this fund a bounty is paid on butter exported. The amount of the bounty has varied from year to year. At the outset it was 3d. When the levy was raised to 1¾d. the bounty was increased to 4d. A year later, January, 1929, it was raised to 4½d. and continued at this rate

[5] Dolinsky, N. V. The agricultural situation in Bulgaria. Report to the International Conference of Agricultural Economists, 1933, p. 11.

[6] Whitlam, A. G. Marketing Organization Annals of the Academy of Political Science, No. 158, November, 1931, p. 114.

until January 1, 1931, when it was reduced to 3½d. Three months later it was reduced to 3d., and a month later to 2½d. It was raised again to 3d. in April, 1932, and remains at this figure.

Australian dairymen claimed that they could not obtain domestic prices above "export parity" or world prices less the handling and freight charges, loss in transit, etc., to the United Kingdom and that their prices were as much as 3d. less than the "world rates". This three pence is what the Australians claim to be the difference between their costs of production and the prevailing London parity. It was said that such costs were materially increased by measures that have given a protected home market to other branches of industry. Therefore, the dairy industry was entitled to some measure of protection[7]. The bonus or bounty is not for the purpose of stimulating exports but for the purpose of providing compensation to exporters and thus enabling an estimated increase of 3d. per pound in the domestic price. To quote a recent opinion, "the direct result of the payment of an export bounty is that automatically, without any regulation, compulsion, or legislation the local price, through the operation of an economic law, rises to the level of the export price, plus the bounty paid"[8].

It is probable that in considering the claims of supporters of many of these schemes it would be necessary to speculate on what might have been had no control been exercised because most of them have operated for a short time during which there has been a general decline in prices.

The successful operation of this scheme is dependent on the consent of the Australian Government. For example, shortly after the scheme came into effect it was necessary to increase the tariff on butter imports. Moreover, consent of the Government is essential because it is believed that the plan contravenes the Australian Anti-Monopoly Law[9].

It should be pointed out that there has been an increase in production of butter in Australia. The output in 1925-26 was 273,314,000 pounds while in 1931-32 it had reached 390,512,000 pounds. Exports to the United Kingdom have increased rapidly. This has made the situation acute because of the extra amount which must be paid to exporters. It should be recognized that a variety of causes may be shown for the increase in butter production such as favourable grazing seasons, low prices of grain, improvement in pasture management, and shifting of land from wheat and wool production to dairying. Relative prices of agricultural products was another factor.

Besides the Paterson Plan there are several Export Control Boards in operation: for example, the Dried Fruits Control Board, the Canned Fruits Control Board, and the Dairy Produce Control Board which has acted as a regulating agency under statutory powers since 1925. There is, moreover, State legislation governing the Marketing of Primary Products to which reference will be made later on.

In this connection it should be pointed out that a recent decision of the Australian Supreme Court renders illegal an Act of Orderly Marketing which hampers the freedom of interstate traffic which is guaranteed by the constitution. This decision affects the operation of most of the Control Boards. It implies that both state and federal legislation is required and that State Boards may be set up under federal co-ordination[10]. In the case of butter it is proposed that the state governments should pass legislation whereby an export quota would be fixed by the State Control Board. At the time this is written it is not known how far this proposal has progressed but it suggests that the Paterson Plan may soon be superseded.

[7] Brookens, P. F. The Paterson Plan and Australian butter prices. Journal of Farm Economics, Vol. X, No. 4, October 1928, pp. 540-543.

[8] Cooke, A. J. The Paterson scheme, Journal of the Department of Agriculture for South Australia, Vol. XXXVI, No. 3, October 15, 1932, p. 323.

[9] Edminster, L. R., Schaben, L. J., and Lynsky, M., F-S 56. Agricultural price supporting measures in in foreign countries. Bureau of Agricultural Economics, Washington, D.C., p. 25.

[10] Foreign Crops and Markets. Bureau of Agricultural Economics, U. S. Department of Agriculture, Washington, D.C., Vol. 27, No. 1, p. 8.

SOME ASPECTS OF THE FARM TAX SITUATION IN ONTARIO[1]

S. C. HUDSON[2]

Perhaps one of the most serious problems, arising out of the chaos of depression, by which agriculture is confronted is the farm tax situation. The inability of farmers to meet their taxes after obtaining even a meager living off their farms, is manifested by the large amount of arrears of taxes which has accumulated in almost every rural municipality.

To have a clear understanding of the present farm tax situation it is necessary to know something of taxation trends throughout the preceding period and to study the relationship of these trends to other economic factors. For this purpose an index number of farm taxes in Ontario was constructed, based on taxes levied in some 94 selected townships for the period 1906 to 1932. This index which is presented in

TABLE 1.—INDEX NUMBERS OF FARM TAXES IN ONTARIO 1906-1932[1] AND OF WHOLESALE PRICES OF FARM PRODUCTS 1913-1932[2]
(1926 = 100)

Year	Farm Taxes	Prices of Farm Products
1906	29.2	–
1907	31.4	–
1908	31.4	–
1909	32.4	–
1910	34.0	–
1911	35.8	–
1912	37.8	–
1913	42.0	62.6
1914	45.1	69.2
1915	51.2	77.7
1916	56.2	89.7
1917	63.3	130.0
1918	71.6	132.9
1919	70.7	145.5
1920	83.3	161.6
1921	88.2	102.8
1922	93.9	86.7
1923	95.3	79.8
1924	95.3	87.0
1925	97.1	100.4
1926	100.0	100.0
1927	104.6	102.1
1928	111.8	100.7
1929	114.4	100.8
1930	115.8	82.3
1931	108.0	56.3
1932	99.1	48.4

1 Municipal Statistics, Province of Ontario.

NOTE.—In the construction of the above index number of farm taxes for Ontario, two townships in each of 47 counties were selected. That territory commonly known as Northern Ontario, consisting of the counties of Cochrane, Kenora, Nippising, Rainy River, Sudbury, Thunder Bay and Temiskaming as well as much unorganized territory, was omitted due to shifts in municipal boundaries during the period as well as to the pioneer stage of agricultural development of the territory. Since township taxes include unincorporated villages an attempt was made in the selection of townships to select those having a minimum of non-agricul;ural population in order to minimize the error arising from this point. Attempt was also made to avoid, in so far as possible, those townships having public utilities upon which taxes are levied. While some discrepancy may arise from the points mentioned above, it is thought that an index constructed by this method should measure the trend of farm taxation with reasonable accurateness.

2 Prices & Price Indexes, Dominion Bureau of Statistics.

Table 1 along with an index of the wholesale price of farm products for the period 1913 to 1932, shows that during the period under study, a very substantial increase in farm taxes in Ontario occurred, the highest peak being in 1930. In 1930 farm taxes were almost four times what they were in 1906 and about 2.75 times pre-war or 1913.

[1] Preliminary statement, subject to revision.

[2] Field Assistant, Agricultural Economics Branch, Department of Agriculture, Ottawa.

The greatest increase is seen to have taken place between 1915 and 1922, there being a decided lag in rate of increase in 1919 and between 1922 and 1926, followed by a fairly rapid increase from 1926 to 1929, since which time there has been a marked decline, the index for 1932 being slightly lower than that for 1926.

Comparing the index of farm taxes with that of the wholesale price of farm products for the period 1913 to 1932 it is seen that from 1913 to 1922 taxes lagged behind farm prices and were not particularly burdensome. Between 1922 and 1924 due to a sharp decline in prices taxes became relatively higher. This relationship was changed somewhat in 1925 due to a rise in farm prices. During the period 1925 to 1929, taxes increased fairly rapidly while prices remained more or less constant. The collapse of prices of farm products from 100.8 in 1929 to 48.4 in 1932 was followed by a substantial decrease in taxes in the last two years. It is seen, therefore, that when prices rise, taxes rise less rapidly and, so long as this trend continues, the increased services demanded by the public may be paid for without difficulty. When, however, a fall in prices occurs, the demand for increased services remains. This demand, implemented by public borrowing, often causes a continuation of the upward trend of public expenditures for some years with the ultimate result that the reduction of taxes is made more difficult on account of financial obligations undertaken in previous years.

From an analysis of the taxes paid on 34 farms selected arbitrarily in a representative township of the County of Carleton for the period 1901 to 1931, at five-year intervals, changes in the distribution of the farmer's tax dollar were determined. This distribution, which is shown in Table 2, indicates a trend towards the county equalization of municipal expenditures.

TABLE 2.—DISTRIBUTION OF THE FARMER'S TAX DOLLAR BY FIVE-YEAR PERIODS 1901-1931

Year	County Purposes	Township Purposes	School Purposes	Total Taxes
1901	24.6	31.4	44.0	100.0
1906	23.8	33.2	43.0	100.0
1911	22.7	31.6	45.7	100.0
1916	33.6	25.2	41.2	100.0
1921	33.2	35.2	31.6	100.0
1926	46.8	23.8	29.4	100.0
1931	57.5	17.8	24.7	100.0

While from 1901 to 1911 about 44% of the levy was for school purposes, with less than 25% for county purposes, in 1916 an increased proportion is seen to have been appropriated for county purposes. Since the analysis of the 1931 tax levy shows that over 57% of the farmer's tax dollar is for county purposes, with about 18% and 25% for township and school purposes respectively, it would seem that an analysis of county expenditures and sources of revenue should indicate the factors causing the major part of the increase in taxes.

For the purpose of studying county receipts and expenditures, the United Counties of Stormont, Dundas and Glengarry were selected as being representative of the major part of Ontario.

TABLE 3.—TREND OF EXPENDITURES OF THE UNITED COUNTIES OF STORMONT, DUNDAS AND GLENGARRY BY FIVE-YEAR PERIODS IN TERMS OF THE PERIOD 1902-06

Item of Expense	Per cent of Expenditures for 1902-06				
	1907-11	1912-16	1917-21	1922-26	1927-31
Administration	107.1	139.2	187.1	201.4	239.5
Protection and Administration of Justice	98.3	111.6	124.0	146.7	211.5
Education	174.6	214.0	357.7	719.2	858.8
Highways	108.5	51.4	1,286.4	1,211.9	901.2
Welfare	1,297.0	1,797.5	647.8	1,273.1	3,603.6
Miscellaneous*	78.6	376.3	835.8	323.5	314.2
All items	140.8	282.6	1,306.2	1,400.9	1,372.8

* Includes non-resident land tax, special grants, interest, drainage, war tax, county property, etc.

TABLE 4.—DISTRIBUTION OF EXPENDITURES OF UNITED COUNTIES OF STORMONT, DUNDAS AND GLENGARRY BY FIVE-YEAR PERIODS 1902-31

Item of Expense	1902-06	1907-11	1912-16	1917-21	1922-26	1927-31
Administration	11.3	8.6	5.6	1.6	1.6	2.0
Protection and Administration of Justice	19.7	13.7	7.8	1.9	2.1	3.0
Education	48.7	60.4	36.9	13.3	24.9	30.4
Highways	7.4	5.7	1.4	72.8	63.9	48.5
Welfare	.5	4.6	31.9	2.5	4.6	13.2
Special grants	2.3	2.5	6.5	4.5	.7	.4
War Tax	—	—	7.8	1.7	—	—
Miscellaneous*	10.1	4.5	2.1	1.7	2.2	2.5
Totals	100.0	100.0	100.0	100.0	100.0	100.0

* Includes non-resident land tax, interest, drainage, county property, etc.

Tables 3 and 4, in which the expenditures of the United Counties of Stormont, Dundas and Glengarry from 1902 to 1931 are analysed by five-year periods, show the relative importance of each item of expenditure for each period. While in the early periods administration, protection and administration of justice, and education were the principal items of expenditure, the additional service taken on by the counties during the later periods reduced the first two of these items to relative insignificance. Throughout the period, however, education has remained one of the principal items of expense, being surpassed only by highways following the period 1917-21.

During the period 1912-1916 the expenditures for welfare, which includes care of indigents and lunatics and grants to hospital and other charitable institutions, was relatively high due to large capital expenditures for the establishment of a House of Industry, and on this account may be misleading. During the same period special grants, which include grants for patriotic purposes, and special war taxes made up a relatively large part of the total expenditure.

Following the war, due to the abnormal progress in the field of motor transportation, there was a general demand for improved highways. The consequence of this demand is indicated in the fact that for the period 1917 to 1921 over 70% of county expenditures was for highway purposes. This was followed by a slight decrease in the following period, while for the most recent period expenditures for highway purposes made up about 48% of total expenditures.

The provision of additional social services, such as Mothers' Allowance and Old Age Pensions as well as increased expenditures for the care of the indigent due to depressed economic conditions, is reflected in the increase in welfare expenditure during the last two periods.

Changes in the sources of revenue from which the funds for these increased expenditures were obtained are shown in Table 5.

TABLE 5.—DISTRIBUTION OF RECEIPTS OF THE UNITED COUNTIES OF STORMONT, DUNDAS AND GLENGARRY BY FIVE-YEAR PERIODS 1902-31

Source of Revenue	1902-06	1907-11	1912-16	1917-21	1922-26	1927-31
County Rates	73.6	69.2	72.7	60.5	54.2	66.7
Provincial Government Grants						
Administration of Justice	6.7	3.6	3.2	.5	.5	.8
Education	15.0	23.6	20.2	10.6	12.8	12.3
Highways	—	—	—	26.6	30.9	16.0
Other Sources*	4.7	3.6	3.9	1.8	1.6	4.2
Totals	100.0	100.0	100.0	100.0	100.0	100.0

* Includes licenses, fines, registry office fees, non-resident land taxes, division court jury fund, miscellaneous refunds, house of refuge, hospitals, etc.

While during the period 1902-1906 about 74% of county revenue came from the counties' portion of the general property tax levied by the municipalities constituting the counties, this proportion decreased during the succeeding years until it was 54% in the period 1922-26. Due largely to the decrease in provincial grants for highway purposes during the following period the proportion of the total revenue contributed by the townships increased to about 67%. The data presented in this table, however, indicate a trend in the direction of provincial distribution of municipal expenditures.

It would seem then, that the present farm tax situation is the normal result of a collapse in prices following a period of high prices during which an insatiable demand for additional services was developed, and is due primarily to an unstable or deflated price level.

Co-operative Marketing was the subject of much discussion at the Annual Extension Conference to be held at the Agricultural College, Truro, Nova Scotia, January 2nd - 5th, 1934.

Plans are under way in Australia whereby state and Commonwealth legislation is proposed to authorize the setting up of a new butter marketing plan which will supplant the Patterson Scheme which has been in operation for several years and which has not proven to be adequate under present conditions. Moreover the Dairy Produce Control Act has been declared to be *ultra vires* and the new legislation is designed to overcome objections to the former method of control.

THE COST OF MANUFACTURING CHEESE IN ONTARIO

J. F. Booth[1] and C. V. Parker[2]

This is the first of a series of articles dealing with the economic side of the manufacture of cheese. The data contained in this article were collected in the fall of 1932, and apply to the 1931 operations of 125 Ontario cheese factories. A similar study, comprising 120 factories in the Province of Quebec, was undertaken at the same time, the results of which will be discussed in a later issue of *The Annalist.*

Officials of the Dairy and Economics Branches of the Dominion Department of Agriculture co-operated with the Provincial authorities in the conduct of both studies. In Quebec the authorities were the Animal Husbandry Branch and the Rural Economics Branch of the Department of Agriculture. In Ontario the co-operating agencies were the Dairy Branch of the Ontario Department of Argiculture and the Economics Department of the Ontario Agricultural College.

In this article, the costs of factory operation will be dealt with and in those following other phases will be discussed.

The problems facing the cheese industry in Ontario today are many. Perhaps the most important one affecting production costs, however, is declining volume of business. In 1864 the first cheese factory is reported to have been established in Oxford County, Ontario. From then on a rapid development took place in the industry until early in this century. Since the 1900-04 period there has been a gradual decline in production of cheese in Ontario (and in fact throughout the whole Dominion). In1931, Ontario had 714 factories in which were produced slightly over 84 million pounds of cheese. This figure represents a decrease of 36.4% as compared to a production of nearly 132 million pounds in the year 1900.

With the development of large urban centres and increased demand for milk for fluid consumption and for use in the manufacture of other dairy products the production of cheese declined. Parallelling this development came improved means of transportation, better roads and more suitable means of handling milk, the net effect of this combination of circumstances being increased competition and declining volume of business for cheese factories. It has been difficult for operators of cheese factories to cope with these changed conditions and thus compete with other users of milk.

Milk for cheese production must be delivered each morning and must be clean and cool to make good cheese. Therefore in the establishment of factories it has been necessary always to give consideration to the distance milk could be hauled. In the early period of development, and even yet in most areas, that meant the distance that a patron could haul his milk in a horse drawn vehicle each morning. In consequence the area served by a given factory, particularly in Eastern and Central Ontario, was comparatively small and the distance between factories often but a few miles.

It is believed that the presentation of cost of production figures for factories of different sizes will be of some value to those interested in the cheese factory business in Ontario.

Costs of Manufacturing Cheese. —In the accompanying tables costs are given according to two methods of calculation. Charges for hauling milk to the factory and cheese from the factory are not included.

In Method I, costs were figured from the viewpoint of what it cost the patron. It represents the "actual rates" charged, i.e., the charges made by private owners and the set deductions owners of patron factories make from the sale price of the cheese. In addition, patron organization costs—salaries, stationery and milk testing were

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added to the rates for privately owned factories. Method I, then, deals with costs as the patron thinks of them. It represents in a sense their annual "out of pocket" expense.

TABLE 1.—COMPARISON OF ACTUAL AND TOTAL CHARGES AND EFFECT OF VOLUME ON COST OF CHEESE MANUFACTURE

Size of factory (tons of cheese)	Method I. Actual rates charged		Method 2. Cost of operation including full charges		Difference between two methods
	No. of factories	Cost per pound	No. of factories	Cost per pound	
Under 25	4	2.34	6	2.98	.64
25 – 49.9	29	2.09	35	2.58	.49
50 – 74.9	25	2.13	37	2.36	.23
75 – 99.9	8	2.12	11	2.14	.02
100 – 124.9	6	1.87	12	2.12	.25
125 – 149.9	5	1.78	7	2.00	.22
150 – 174.9	7	1.78	8	1.96	.18
175 and over	6	1.75	9	1.82	.07
All factories	90	1.94	125	2.16	.22

In Table 1, factories are classified according to tons of cheese produced and costs for each size group are given according to both methods of computation. The average cost per pound for Method I was 1.94 cents in 1931. It varied from 2.34 cents for small factories to 1.75 cents for the largest plants.

It was found on examining the costs as worked out by Method I that all charges were not fully met. Factory owners, as a rule, did not make adequate allowance for depreciation in arriving at the rates to be charged for cheese production, and consequently their labour returns were lowered. The same can be said of patron owned plants; patrons actually lost part of their capital by not adequately covering depreciation. The general practice in cheese factories is to meet replacement costs as they occur but in 1931 when retrenchment was taking place, many factory owners probably spent less than usual on capital items. It was found that expenditures to meet depreciation (i.e., new equipment for replacement purposes and reconstruction of buildings) amounted to only 25% of the estimated depreciation charges for that year. Some factory owners spent more than others and, of course, the rates of depreciation do vary in different factories. In order, however, to place all concerns on the same basis and also to take into consideration all the costs incurred in factory operation Method II was adopted. These costs are also presented in Table 1.

For both patron and privately owned factories the costs listed under Method II fell into three categories: (1) the actual cash operating expenses (excluding capital expense and wages to maker) shown on the same basis for both types of factories; (2) interest on capital invested was charged at 5%, depreciation on frame buildings at 5% and on brick or stone structures at 3% of the present value, and depreciation on equipment was calculated on the "years future use" basis; present values and years future use were obtained for the major items of equipment; by dividing the years future use into the present value a depreciation figure for the year of the study was obtained; (3) the salaries for makers were arrived at by deducting their expenses from the amounts they received for making cheese.

Turning to Table 1 again it may be seen that the average cost per pound for manufacturing cheese was 2.16 cents when all charges were taken into account. A comparison of the rates according to both methods of computation reveals that larger factories were meeting all charges more fully than were the smaller plants. Apart

from the smallest group of factories which had a cost of 2.34 cents per pound, the rates according to Method I (actual rates charged) were around 2⅛ cents per pound for factories producing under 100 tons of cheese. A large decrease in actual rates charged occurred between the 75-99.9 ton and 100-124.9 ton group. This was followed by a smaller decrease in the next size group and from there on average rates remained practically the same.

The rates according to Method II were very much higher than actual rates in the first three size groups of factories but they were practically the same for the 75-99.9 ton group. Therefore, if an actual rate of 2-2⅛ cents is to be charged, total costs will be met only when an output of 75 tons or more is reached. Similarly, if 1.87 to 1.75 cents per pound is to be charged, all expenses can only be met by producing over 175 tons of cheese per factory.

The Effect of Volume on Costs.—Besides portraying the differences in costs between Methods I and II, Table 1 also shows the effect of volume on costs of production. The total cost for factories producing under 25 tons of cheese was 2.98 cents per pound. With each increase in the volume of production a decrease in the rate or cost per pound took place. In the largest producing group, 175 tons and over, the rate was 1.82 cents. In all, a decrease in costs of 1.16 cents per pound was recorded. Economy in producing cheese is thus clearly linked up with volume of production.

The costs presented in Table 1, Method II, are given in considerably more detail in Table 2. Here, the effect of volume on various items of expense is clearly shown. The cost per pound attributable to boxes, supplies and fuel did not decrease appreciably with increases in size of factory for reasons more or less obvious. However, in the larger factories there was a decided reduction per pound when so-called fixed charges—taxes, insurance, interest and depreciation—were considered. Although hired

TABLE 2.—COST PER POUND OF CHEESE OF MAIN ITEMS OF EXPENSES BY SIZE OF FACTORY

Main items of expense	Size of factory — Cents per pound of cheese								All factories
	Under 25 tons	25 to 49.9	50 to 74.9	75 to 99.9	100 to 124.9	125 to 149.9	150 to 174.9	175 and over	
Boxes	.297	.286	.287	.270	.345	.312	.315	.321	.306
Supplies	.304	.304	.268	.280	.255	.223	.274	.248	.265
Fuel	.310	.211	.241	.235	.255	.255	.273	.235	.248
Taxes and Insurance	.093	.103	.089	.083	.064	.062	.054	.051	.072
Organization salaries	.147	.082	.083	.084	.055	.062	.042	.063	.069
Hired labour and board	.001	.113	.188	.190	.374	.350	.382	.397	.281
Maker's salary	1.245	.974	.810	.678	.522	.489	.405	.414	.628
Other factory expenses	.048	.041	.038	.038	.039	.038	.032	.041	.039
Repairs	.073	.088	.083	.086	.127	.073	.060	.077	.080
Interest	.187	.180	.167	.157	.137	.148	.148	.086	.144
Depreciation	.305	.286	.252	.271	.218	.212	.193	.125	.218
Gross expenses	3.010	2.665	2.505	2.374	2.392	2.223	2.184	2.055	2.349
Whey credit	.030	.088	.143	.229	.271	.224	.219	.231	.194
Net expense	2.98	2.58	2.36	2.14	2.12	2.00	1.96	1.82	2.16
No. of factories	6	35	37	11	12	7	8	9	125

Note: In the handling of the whey product costs it was agreed to include that portion of the receipts received by the maker as a charge to the factory business. To offset this charge, and thus arrive at the cost of manufacturing cheese, the remaining portion of the receipts (the amount received by the patrons), was deducted from the total expense. The net expense thus obtained was divided by the number of pounds of cheese manufactured in order to obtain the cost per pound.

TABLE 3.—RANGE OF COSTS PER POUND FOR MANUFACTURING CHEESE

Costs (cents per pound)	Number in class	Weighted average for each class	Percentage Distribution
Under 1.60	1	1.59	.8
1.60 – 174	4	1.65	3.2
1.75 – 1.99	19	1.87	15.2
2.00 – 2.24	29	2.13	23.2
2.25 – 2.49	34	2.35	27.2
2.50 – 2.74	19	2.61	15.2
2.75 – 2.99	11	2.85	8.8
3.00 – 3.24	7	3.11	5.6
3.25 and over	1	3.27	.8
Total or average	125	2.16	100.0

labour costs (other than maker) increased with volume of production the amount paid to cheese makers, when computed on a per pound basis, decreased rapidly with increases in volume of production. Thus larger concerns were much more efficient in the use of the largest expense item in factory costs.

In Table 3 costs are presented in a slightly different way. Here, the factories are arranged in groups according to costs of operation and it will be observed that the extremes were 1.59 cents per pound in one factory and 3.27 cents in another. This difference was due almost entirely to the much larger volume of business handled in the low cost factory. About 50% of the factories were within the group represented by costs ranging from 2.00 cents to 2.50 cents per pound.

Summary and Conclusions.—The cost of manufacturing cheese is closely related to output. The extreme difference in costs between the highest and lowest cost factories was 1.68 cents per pound or the equivalent of about 15 cents per hundred pounds of milk. At prices prevailing in 1931 this represents a difference of about 20%. The difference between the costs incurred in the group of factories producing less than 25 tons annually and those of factories with an average output of 175 tons per year was 1.16 cents or approximately 10 cents per hundredweight of milk.

This large reduction in costs was achieved by making maximum use of labour, plant and equipment, and since, in this business, any benefit thus obtained is reflected directly in the price paid for milk, it would appear desirable to increase the volume of business wherever possible. In many cases this could best be achieved by the amalgamation of factory districts and the closing of unnecessary factories. This, in turn, would mean longer hauls by patrons, or, if the conditions of roads permitted, the organization of milk routes.

Where the conditions of roads do not permit of the hauling of heavy loads such as would be necessary if milk routes were organized and where patrons do not wish to haul their own milk longer distances, increased volume would have to be obtained by lengthening the period of operation, by increasing the size of herds and production per cow or by diverting milk which now goes to city milk plants, creameries or condensaries.

It is appreciated that there are other things to consider in connection with factory amalgamation. Nevertheless, there are many cases where the area served by a factory could advantageously be enlarged, and patrons would be well advised to give careful thought to the question.

The Journal of the Ministry of Agriculture, December, 1933, reports that the Hops Marketing Board has placed valuations on representative samples of the 1933 crop. Trading opened on October 30th; the Board has been able to dispose of considerable quantities at prices within the values established. The Brewing Industry has, however, issued a formal complaint against the Board's operation and the matter has been referred to a Committee of Investigation.

ECONOMIC LITERATURE

F. M. Clement. Report on the Enquiry Conducted on Behalf of Six Locals of the Associated Growers of British Columbia Limited, 1933.

This report covers "some aspects of the relations of the Southern Locals of the Associated Growers of British Columbia Limited as compared with the Northern Districts, and the marketing problems confronting the co-operative producers of Fruit and Vegetables in the Okanagan Valley of British Columbia." The report gives a detailed and thorough outline of the operations of the Associated Growers' Central and Local organizations. Opinions expressed by growers and officers have been used freely, and together with the author's opinions and recommendations, a very concise picture of the industry has been presented.

Space does not permit of the presentation of all the difficulties to be overcome that are mentioned in the report; the following summary contains a few of them.

The problem is that "a certain feeling of dissatisfaction is evident" among growers . . . . "Dissatisfaction with the Central (organization) is not only wide-spread and deep, but at times among some of the membership is critical up to a point of distrust. On the other hand, a similar review indicates that there is relatively little criticism of the locals, their management or their directors." In the author's opinion the locals are not entirely blameless. Each local believes that it enjoys special advantages that other locals do not enjoy and in a spirit of "self-determination" endeavours to capitalize these advantages. Speaking broadly, "the local expects the Central to sell all products produced, regardless of quality or grade, at a price which is remunerative to the grower."

The Central, on the other hand, "naturally feels that a better showing could be made if they could select the tonnage according to market demand. They feel that the locals should be subject to some dictation, if not control."

The duties of the Central have been made particularly hard due to the changing business organization in the prairie markets during the last few years. Business connections with large distributing firms are important "if the tonnage of any one large packing company is to be placed to advantage." The changes in the distributive "set-up" on the prairies, as listed in the report, have had far-reaching effects on the sales policy of the Central.

At the outset the Associated was a "Save the Industry" organization. It came into being in 1923 following two years of disastrous prices. "The organization campaign aimed at 100% control. At no time however, did the Associated control more than 85% of the tonnage. The ideas of stabilization and price regulations were fundamental to the organized campaign." Tonnage control fell from 85% in 1923 to 40% in 1933, but "the idea of stabilization persisted." The failure of the Board to realize earlier that less than 100% control could not stabilize the market is, in the opinion of the author, the fundamental cause of dissatisfaction at the present time.

However, the Board of Directors now recognizes it's functions to be: (1) to obtain a competitive price for their growers, and (2) to join whole-heartedly any reasonably sound plan for price regulation and stabilization of the industry as a whole.

In summing up, the author's main recommendations were as follows:

(1) "That no change be made at the present time in relation to Central Selling; that all assets be preserved but that such changes as are necessary be made to make the machine operate more efficiently . . . . in the interest of the membership."

(2) "That, as a general policy for operation, you consider operating as an independent business concern made up of co-operative growers and distributors."

(3) "That every man be paid all that his particular grade and quality of product will bring—without 'sweetening or penalty' direct or indirect in any pool."

(4) "That zone pooling be inaugurated if desired by the locals."

(5) "That you recognize the principle of "selective co-operation;" . . . . and that there should be a limit to the time a grower could continue to produce certain varieties and grades and expect the local to pack and the Central to sell them."

(6) "That Central and all locals be put on a budget basis; the budget to be based on the expenditures of the past."

(7) "That since the idea of 'save the industry' is not now the first responsibility of the Associated, all activities in assisting and selling for organizations outside of the Valley be discontinued unless full costs for such operations are paid for . . . ."

(8) "That the cold storage plants be recognized as an important and integral part of the industry that is essential to every variety of apples . . . ."

(9) "That British Columbia except (for the present) Vancouver, Victoria, New Westminster and Prince Rupert, be recognized as open markets for competitive operation on the part of locals or on the part of truckers supplied by locals. That after due consideration certain towns, large and small in Southern Alberta and Southern Saskatchewan be recognized as open markets as well."

This Report is not available for general distribution.

NOTES

In the Province of Quebec new rules have been instituted regarding the transportation of milk and cream from the producer to the distributor. Transportation by any motor or animal driven vehicle of milk or cream is only authorized between 5 and 10 o'clock in the morning, standard time, between May 1 and November 1. On Saturday evenings, however, milk or cream may be transported to country factories between 5 and 9 o'clock standard time during the same period. From November 1 to May 1, transportation is allowed only between 5 a.m. and 1 p.m. and on Saturdays between 5 p.m. and 9 p.m.

Preliminary arrangements for a world-wide minimum scale of wheat prices are to be presented to the International Wheat Commission on January 22, 1934, by a marketing committee of that organization. The committee does not hope to go further than to suggest what should be the price differentials for the various kinds of wheat and it will be left to the Commission to decide the actual prices. Delegates from big wheat-producing nations are convinced that a minimum scale is necessary for two or three months to tide wheat over from its current low ebb in the world's market.

J. F. Booth, Department of Agriculture, Ottawa, J. E. Lattimer, Macdonald College, P.Q., and T. W. Grindley, Dominion Bureau of Statistics, Ottawa, have been appointed by the National Advisory Committee on Agricultural Services to formulate plans for the presentation of an agricultural outlook report for Canada.

A meeting of the Joint Federal-Provincial Committee on Agricultural Economics for Ontario was held in Toronto, November 27th and 28th. This was the third meeting of the Committee which was constituted in 1931 at a Conference called by the Ministers of Agriculture of the respective departments to devise ways and means of handling the urgent problems facing agriculture. One of the purposes of the Committee has been to eliminate overlapping of effort and duplication of work. To that end the various agencies interested in agricultural economics and allied fields of work reviewed what was being done and considered projects that should be undertaken. The co-operation of Departments of Agriculture, Bureau of Statistics, Universities and Colleges interested in Ontario agriculture has been furthered by the work of this Committee. Those attending the recent meeting and the organizations represented were as follows: W. B. Somerset, Ontario Marketing Board, Toronto; Geo. Barr and J. A. Carroll, Department of Agriculture, Toronto; Professors F. C. Hart and C. W. Riley, Ontario Agricultural College, E. E. Rielly, Western University and W. R. Drummond, Toronto University; Dr. J. F. Booth, J. Coke, R. L. Wheeler, P. E. Light, Dominion Department of Agriculture; Dr. T. W. Grindley, Dominion Bureau of Statistics.

L'ECONOMISTE AGRICOLE

REVUE TRIMESTRIELLE DE L'INDUSTRIE AGRICOLE PUBLIEE PAR LA DIVISION DE L'ECONOMIE AGRICOLE, MINISTERE FEDERAL DE L'AGRICULTURE, OTTAWA

Vol. III. Nos. 10, 11, 12. Oct., nov., déc., 1933

LA SITUATION ECONOMIQUE

PREPARE PAR LA DIVISION DE L'ECONOMIE AGRICOLE DU MINISTERE DE L'AGRICULTURE, OTTAWA, ET BASE SUR LES DONNEES RECUEILLIES PAR LE BUREAU FEDERAL DE LA STATISTIQUE

Les prix de gros au Canada se sont relevés au cours de novembre. L'indice compilé par le Bureau fédéral de la statistique était de 68.7 contre 67.9 en octobre. Les hausses ont porté sur les groupes suivants: légumes et leurs produits, animaux et leurs produits, bois, produits de bois et papier, fer et ses produits, et les métaux non ferreux et leurs produits. Par contre, les fibres, les textiles et les produits textiles, les minéraux non métalliques et leurs produits et les produits chimiques et de même nature ont rétrogradé.

Prix de détail.—De 77.9 qu'il était en octobre, l'indice des prix de détail, des loyers et des frais de services, s'est élevé à 78.1 en novembre. Cette avance est due principalement à une hausse des prix des aliments et, à un moindre degré, à une hausse dans l'indice du combustible.

Embauchage.—L'indice de l'embauchage, qui était de 88.4 au 1er novembre, est passé à 90.9 au 1er décembre. C'est là une avance de près de 8 points sur l'indice du 1er décembre 1932.

Volume physique des affaires.—L'indice du volume physique des affaires est tombé à 85.5 en novembre; celui de la production industrielle de 87.4 à 83.9; celui des industries manufacturières, de 87.9 à 86.2. Par contre, l'indice de l'industrie forestière est monté de 86.2 à 87.2. La production du fer et de l'acier est tombée de 37.3 à 33.4; le bâtiment de 42.6 à 37.3. La production de l'énergie électrique est montée de 148.8 à 158.1. Les importations ont été plus considérables, mais l'indice des exportations a baissé.

Produits agricoles.—Les prix des produits de ferme canadiens ont monté en novembre. L'indice des produits des champs s'est élevé de 44.6 à 46.7, celui des produits animaux de 62.8 à 65.8. L'indice total est donc passé de 51.4 en octobre à 53.8 en novembre. Le dernier prix moyen du blé du Nord Manitobain No. 1, à Fort William, était de 60.5c. le boisseau en octobre, contre 63.7c. en novembre. Les prix de l'orge, de l'avoine, du lin et du seigle ont un peu remonté. On a obtenu de meilleurs prix pour les boeufs, les porcs, les moutons, les agneaux, le lait, les oeufs et la laine, et l'indice des animaux et de leurs produits s'est élevé de trois points. Les prix des produits de ferme sont encore très bas, mais il est à noter qu'à tout prendre la courbe de ces prix n'a cessé de monter en 1933.

Les ventes agricoles ont été bien inférieures à celles d'octobre. L'indice des ventes de grain est tombé de 70.0 à 36.7, l'indice du blé de 75.6 à 40.1 et celui de l'avoine de 97.2 à 35.9. Il ne s'est transporté que relativement peu d'orge, de lin ou de seigle. L'indice total est donc tombé de 70.5 en octobre à 41.8 en novembre.

Les ventes de bestiaux se sont mieux maintenues que celles du grain. L'indice des ventes de boeufs, qui était de 56.2, est tombé à 50.7. Chez les porcs, la baisse a été de 93.6 à 88.0, chez les moutons de 98.8 à 61.7. Il y a eu une forte réduction dans le mouvement des veaux, l'indice qui était de 102.8 en octobre est tombé à 89.9 en novembre. L'indice total est donc descendu à 41.8.

CHIFFRES-INDICES, ANNUELS ET MENSUELS, DES PRIX ET DE LA PRODUCTION COMPUTES PAR LE BUREAU FEDERAL DE LA STATISTIQUE

Année	Prix de gros 1926 = 100				Prix de détail et coût des services (5)	Production (6) 1926 = 100			
	Tous produits (1)	Produits de ferme (2)	Produits des champs (3)	Produits animaux (4)		Volume physique des affaires	Production industrielle	Ventes de produits agricoles	Produits en entrepôts froids
1913....	64.0	62.6	56.4	77.0	65.4	....	....	....	....
1914....	65.5	69.2	64.9	79.0	66.0	....	....	....	....
1915....	70.4	77.7	76.9	79.2	67.3	....	....	....	....
1916....	84.3	89.7	88.4	92.3	72.5	....	....	....	....
1917....	114.3	130.0	134.3	119.6	85.6	....	....	....	....
1918....	127.4	132.9	132.0	134.7	97.4	....	....	....	....
1919....	134.0	145.5	142.4	152.5	107.2	71.3	65.5	48.1	47.1
1920....	155.9	161.6	166.5	149.9	124.2	75.0	69.9	52.6	94.2
1921....	110.0	102.8	100.3	108.5	109.2	66.5	60.4	65.2	86.4
1922....	97.3	86.7	81.3	99.1	100.0	79.1	76.9	82.6	82.8
1923....	98.0	79.8	73.3	95.1	100.0	85.5	83.8	91.4	87.6
1924....	99.4	87.0	82.6	97.2	98.0	84.6	82.4	102.5	114.9
1925....	102.6	100.4	98.1	105.7	99.3	90.9	89.7	97.2	108.6
1926....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.9	100.0
1927....	97.7	102.1	99.9	105.7	98.4	106.1	105.6	103.6	110.0
1928....	96.4	100.7	92.6	114.3	98.9	117.3	117.8	146.7	112.8
1929....	95.6	100.8	93.8	112.5	99.9	125.5	127.4	101.1	109.6
1930....	86.6	82.3	70.0	102.9	99.2	109.5	108.0	103.0	128.4
1931....	72.2	56.3	43.6	77.6	89.6	93.5	90.4	99.0	125.7
1932....	66.7	48.4	41.1	60.7	81.4	78.7	74.0	114.3	120.1
1933									
Jan....	63.0	43.6	35.1	57.9	79.1	68.1	62.2	56.1	112.0
Fév....	63.6	43.0	36.0	54.7	78.4	67.0	60.0	76.5	127.6
Mars...	64.4	44.7	38.0	56.0	77.8	68.4	62.5	129.0	135.8
Avril...	65.4	46.8	41.1	56.4	78.1	69.8	65.1	104.1	112.7
Mai....	66.9	51.2	46.9	58.4	77.0	76.4	72.7	95.4	100.4
Juin....	67.6	52.6	49.4	57.9	77.0	82.2	79.8	221.9	119.9
Juillet ..	70.5	60.1	60.8	59.0	77.2	84.1	82.6	221.9	119.9
Août	69.4	57.0	54.9	60.5	78.6	89.8	89.5	197.2	114.2
Sept....	68.9	54.7	49.5	63.4	78.8	90.8	90.2	101.1	115.7
Oct....	67.9	51.4	44.6	62.8	77.9	88.2	87.4	70.5	112.7
Nov....	68.7	53.8	46.7	65.8	78.1	85.5	83.9	41.8	111.1

1. Voir Prix et Indices des prix, 1913-1928, pages 19-21, 270-289 et 1913-1931, page 15.

2. Prix de gros des produits de ferme canadiens. Voir Prix et Indices des prix, 1913-1931, page 33, et miméographes mensuels 1932 et 1933.

3. Prix de gros des grains, fruits et légumes.

4. Prix de gros des animaux et des produits animaux.

5. Y compris la nourriture, le loyer, le combustible, les vêtements et objets divers. Voir Prix et Indices des prix, 1913-1928, pages 181-185, 290-293. 1926 = 100.

Prix et Indices des prix, 1913-1931, page 122, et miméographes mensuels, 1932-1933.

6. Revue mensuelle de la statistique commerciale, page 8 et indices mensuels du volume physique des affaires au Canada. Supplément à la Revue mensuelle de la Statistique commerciale, novembre 1932.

L'indice des produits conservés au froid était un peu plus bas en novembre. Les stocks d'oeufs, de saindoux et de fromage étaient un peu plus élevés qu'en octobre, mais ceux des autres produits étaient un peu plus bas que le mois précédent. C'est dans les approvisionnements de mouton que le changement le plus considérable a été enregistré.

Récoltes des champs.—La section agricole du Bureau fédéral de la statistique a publié dernièrement son bulletin annuel de l'étendue ensemencée en récoltes de grande culture. Un fait intéressant à noter, c'est que l'étendue totale a été réduite de plus d'un million d'acres. L'étendue ensemencée en 1932 était de 57,734,000 acres, tandis qu'elle était de 56,580,550 acres en 1933. L'étendue totale en blé, qui était de 27,182,000 acres, a été réduite à 25,991,100 acres. L'étendue en avoine, qui était de 13,148,400

acres en 1932, a été portée à 13,528,900 acres en 1933. Par contre, l'orge qui occupait 3,757,600 acres en 1932 couvrait 3,658,000 acres cette année. Il y a eu une réduction considérable dans l'étendue en seigle; le chiffre est de 773,800 acres pour 1932 et de 583,100 acres en 1933. L'étendue en lin était également moins considérable en 1933, soit 243,600 acres, contre 453,700 acres en 1932. Il y a eu, par contre, une augmentation sensible dans l'étendue en luzerne. Quant aux autres récoltes, les changements de superficie sont peu importants.

Les rendements par acre des récoltes mentionnées ci-dessus étaient les suivants: blé 15.8 boisseaux en 1932, contre 10.5 en 1933; avoine 29.8 et 23 boisseaux, respectivement; orge 21.5 et 17.4; seigle 11.6 et 8.1; graine de lin 5.4 et 2.8; grains mélangés 33.0 et 28.4 boisseaux par acre.

La valeur des récoltes des champs était évaluée à $432,199,400 en 1931, $444,894,900 en 1932 et $427,791,000 en 1933. La valeur moyenne estimée était la suivante: blé 35c. le boisseau en 1932 et 45c. en 1933; avoine 19c. et 25c., respectivement, orge 23 et 26c., seigle 27 et 34c., graine de lin 62 et $1.12, grains mélangés 33c. et 39c. Naturellement, ces chiffres ne sont que préliminaires.

Nombre d'animaux.—Le Bureau fait rapport que le nombre de chevaux sur les fermes a diminué en 1933. Par contre, le nombre des bovins a augmenté, tandis que celui des moutons et des porcs diminuait. Il y a eu une très forte réduction dans le nombre de poules et de poulets, tandis que le nombre des autres espèces de volailles augmentait.

Ventes de bestiaux.—D'après le rapport du commerce des bestiaux du 21 décembre, le nombre de bovins vendus pendant 51 semaines de 1933 a été de 590,467 contre 563,636 pendant la même période en 1932. Le nombre de veaux vendus pendant les mêmes périodes a été de 312,522 et 298,269, respectivement, celui des moutons de 464,058 en 1933 et de 463,010 en 1932. Les porcs vendus aux parcs publics à bestiaux et directement aux salaisons se chiffraient par 3,087,582 cette année, contre 3,056,119 en 1932.

Production du beurre.—La Division fédérale de l'industrie laitière annonce que la production du beurre au Canada pendant les dix mois qui ont pris fin le 31 octobre, a été de 195,237,239 livres, contre 190,018,592 livres pendant la même période en 1932, soit une augmentation de 2.7 pour cent. La production a diminué dans l'Ile du Prince-Edouard, au Nouveau-Brunswick, en Colombie-Britannique et Québec, mais elle a augmenté dans les autres provinces. C'est l'Alberta qui a la plus forte augmentation, 13.3 pour cent de plus qu'en 1932, suivie par la Saskatchewan (10.4 pour cent).

Quantité de fromage classée.—Pendant la période allant du 28 novembre 1932 au 2 décembre 1933, il s'est classé 1,171,634 fromages contre 1,296,444 pendant la période précédente de douze mois.

Pommes et pommes de terre.—La Division des fruits évalue la production commerciale de pommes à 4,892,000 barils en 1933 contre 3,977,000 barils en 1932. L'étendue en pommes de terre a été évaluée à 527,700 acres en 1933 contre 521,500 acres en 1932. Le rendement a été évalué à 41,542,000 quintaux cette année, contre 39,416,000 quintaux en 1932.

De nouveaux règlements viennent d'être établis dans la province de Québec, touchant le transport du lait et de la crème entre le producteur et le distributeur. Le transport par camions ou par vehicules à traction animale du lait ou de la crème n'est autorisé qu'entre 5 et 10 heures du matin, heure normale, entre le 1er mai et le 1er novembre. Le samedi soir, le transport du lait et de la crème aux fabriques de la campagne pourra se faire entre 5 et 9 heures, heure normale, pendant la même période. Entre le 1er novembre et le 1er mai, le transport n'est autorisé qu'entre 5 heures du matin et 1 heure de l'après-midi, et le samedi entre 5 heures du soir et 9 heures du soir.

TENTATIVES DE CONTROLE DES VENTES PAR LES COMMISSIONS DU GOUVERNEMENT OU LES ORGANISATIONS AGISSANT AVEC L'APPUI DU GOUVERNEMENT

Partie II[1]

J. Coke[2]

Nous continuerons l'exposé dans cet article du contrôle des ventes. Nous ne nous proposons pas de discuter les mérites relatifs des systèmes de contrôle ni de les comparer, au point de vue des résultats, aux méthodes habituelles de vente, mais plutôt de présenter sur les systèmes adoptés dans différents pays les renseignements que nous possédons et que nos lecteurs pourraient avoir des difficultés à se procurer ailleurs.

Le monopole des céréales en Bulgarie.—L'exercice d'un monopole public est devenu la règle dans certains pays, spécialement en ce qui concerne les grains panifiables et le tabac.

En décembre 1930, le gouvernement bulgare créa le Bureau central d'achat du grain, qui fut autorisé à acheter, à prix fixes, du blé et du seigle et qui commença à fonctionner en février 1931. Ce Bureau employait comme agents les coopératives, les banques et les marchands; il payait les producteurs en argent comptant et en crédits sur les taxes, ces derniers étant remboursables avant le 1er septembre 1931. C'était en somme un moyen de permettre au cultivateur de payer ses taxes, mais il causa une réduction correspondante dans le revenu de l'Etat tout en ajoutant aux charges du Trésor.[3] Au début, les paiements pour le blé ne devaient être que de vingt-cinq pour cent en argent comptant, mais ils pouvaient s'élever jusqu'à cinquante pour cent dans les achats de seigle. La proportion "comptant" fut augmentée en août 1931, et le Bureau fut autorisé à fixer des taux d'emmagasinage au besoin.

Des fonds furent pourvus au moyen d'emprunts, contractés aux banques agricoles ainsi qu'à la banque coopérative. Le total des emprunts originaux se montait à $288,000. Lorsque le Bureau fut établi, il n'était autorisé qu'à acheter du blé et du seigle à des prix plus élevés que ceux qui avaient cours sur les marchés mondiaux. Ces prix devaient être arrêtés en conférence avec les représentants du gouvernement, les banques, les coopératives et les bourses à grain.[4]

Comme les prix payés par le Bureau étaient supérieurs à la cote mondiale, la quantité de grain reçue au début fut si forte qu'il se vit obligé d'abaisser ses prix. Toutefois, après quelque huit mois de fonctionnement les paiements en argent comptant dépassaient le montant des ventes, et il fut alors décidé que le gouvernement se chargerait du contrôle exclusif. Une série d'arrêtés en conseil à cet effet parut en octobre 1931. Le Bureau central d'achat du grain continua d'appliquer les règlements. Le Bureau devint ainsi l'unique acheteur ou vendeur de céréales au pays; et il fut déclaré illégal de vendre de la farine qui n'était pas faite avec du blé acheté par le Bureau ou contrôlé par le Bureau. L'industrie de la minoterie fut mise sous la surveillance directe du Bureau. Un contrôleur fut nommé pour chaque grand moulin commercial, et lorsque plusieurs petits moulins pouvaient être groupés commodément, ils étaient placés sous la direction d'un contrôleur unique. Le contrôleur a pour fonctions d'auditer les livres et de vérifier toutes les déclarations. Les salaires de ces officiers sont prélevés par le Bureau, sur les fonds fournis par les minoteries commerciales. Les moulins à pratiques sont placés sous la direction du maire de la municipalité dans laquelle ils se trouvent et auquel on doit s'adresser pour avoir un permis de mouture de blé ou de seigle.

En ce qui concerne les ventes l'enregistrement à la bourse au point de livraison pour l'exportation de toutes les ventes d'exportation, est obligatoire. Une commission de deux pour cent doit être payée à la bourse. Est obligatoire également l'enregis-

[1] Voir l'Economiste agricole, Vol. III, No. 7, 8 et 9, p. 76-78.

[2] Commissaire adjoint, Division de l'économie, Ministère de l'Agriculture, Ottawa.

[3] Dolinsky, N. V. La situation agricole en Bulgarie. Rapport à la Conférence internationale des économistes agricoles, 1933. Miméographié, p. 9-10.

[4] Pour de plus amples renseignements voir Edminster, L. R., Schaben, L. J., et Lynsky, M., F-S 56. Agricultural Price Supporting Measures In Foreign Countries. Bureau de l'économie agricole, Ministère de l'Agriculture des Etats-Unis, Washington, D.C., p. 44.

trement de toutes les ventes à la bourse de Sofia pour la consommation locale et les frais de commission dans ce cas sont de un pour cent; ce montant doit être redistribué parmi les bourses sur une base proportionnelle.

Au commencement de 1932 un cartel spécial ou une loi de monopole fut promulgué, autorisant l'Etat à dissoudre les monopoles et à fixer les prix. Des mesures ont déjà été prises en ce qui concerne le monopole du sucre. Les prix de la farine, du sucre, du sulfite de cuivre, de l'huile de tournesol et d'autres produits ont été officiellement fixés.[5]

D'autres pays et notamment la Pologne, la France, la Grèce, le Japon, et la Hongrie, ont acquis le contrôle de certaines céréales et de certains autres produits. L'Allemagne a un quasimonopole du blé.

Le système Chadbourne du contrôle du sucre.—Sous ce système les principaux pays exportateurs de sucre se sont entendus en mai 1931 pour restreindre les exportations de sucre. Les pays intéressés étaient les suivants: Cuba, Java, Allemagne, Tchécoslovaquie, Pologne, Hongrie et Belgique. Ces pays représentent environ quarante pour cent de la production mondiale de sucre et environ quatre-vingt-dix pour cent des exportations. Le Pérou et la Yougoslavie sont entrés plus tard dans cette convention. Le système Chadbourne ne se contente pas de fixer un contingentement pour les exportations mais il restreint la production en limitant l'étendue cultivée. Ce système est administré par un conseil permanent, appelé le Conseil international du sucre, dont les quartiers généraux sont à La Haye. L'objet était de réduire graduellement les approvisionnements de sucre.

Il était entendu que les contingents d'exportation seraient augmentés de cinq pour cent lorsque le prix f.b. du sucre cubain brut atteindrait deux cents par livre et que ce niveau serait maintenu pendant trente jours. Un nouveau relèvement des contingents d'exportation devait être effectué à mesure que les prix monteraient. Une entente intéressante fut conclue aux termes de laquelle, dans le cas où l'Allemagne n'exportait pas tout son contingent en une année quelconque, le Cuba, la Pologne, la Hongrie et la Tchécoslovaquie seraient autorisés à augmenter leurs exportations pour combler le déficit. Des stocks de surplus dans chacun de ces pays ont été déclarés, et ces stocks doivent être réduits par portions annuelles.

Le système Chadbourne s'est heurté à quelques difficultés, provenant de la diminution dans la consommation du sucre. La production du sucre a été restreinte mais il ne paraît pas qu'il y ait eu une diminution sensible dans l'accumulation de stocks. Il lui reste encore trois ans cependant pour démontrer son efficacité. Le contingent cubain a été relevé à une réunion du Conseil en décembre 1932 à cause de la diminution des exportations sur les Etats-Unis. Le niveau des prix auxquels le premier relèvement du contingent peut être fait, a été réduit à 1.75c f.b. Cuba, sans doute à cause des cours moins élevés. Ce système a l'appui des gouvernements des pays intéressés. C'est d'ailleurs une tentative vers une unité d'action internationale qui est plus difficile à réaliser que l'unité nationale ou régionale.

Le système Paterson de stabilisation.—Ce système a été appliqué à la vente du beurre australien. Il fonctionne depuis le 1er janvier 1926. Il se propose trois objets:[6] (1) faire compensation pour les frais excessifs de production résultant du système fiscal de l'Australie; (2) aider à vendre le beurre de surplus; (3) stabiliser les prix du beurre en Australie. Disons ici que ce système est volontaire et qu'il est appliqué par un Comité fédéral de stabilisation, lequel se compose de représentants des intérêts laitiers coopératifs et des fabricants. Il y a également un Comité entre Etats avec Divisions d'Etat. En 1926, sous cet arrangement qui est volontaire, une taxe a été prélevée sur tout le beurre produit dans les fabriques de l'Australie, sauf dans l'état de l'Australie occidentale. Le montant de cette taxe était en premier lieu de 1d. par livre, mais il a été élevé en 1928 à $1\frac{3}{4}$d. On paie sur ce fonds une prime pour le beurre exporté. Le montant de cette prime a varié d'une année à l'autre. Il était au début de 3d. Lorsque la taxe a été élevée à $1\frac{3}{4}$d. la prime a été portée à 4d. Une année plus tard, en janvier 1929, elle a été portée à $4\frac{1}{2}$d. et maintenue à ce taux

[5] Dolinsky, N. V. La situation agricole en Bulgarie. Rapport à la Conférence internationale des économistes agricoles, 1933, p. 11.

[6] Whitlam, A. G. Marketing Organization Annals of the Academy of Political Science, No. 158, novembre 1931, p. 114.

jusqu'au 1er janvier 1931, lorsqu'elle fut réduite à 3½d. Trois mois plus tard, elle fut réduite à 3d., un mois plus tard à 2½d. Elle fut de nouveau relevée à 3d., en avril 1932, et elle est encore à ce chiffre.

Les laitiers australiens prétendaient qu'ils ne pouvaient obtenir des prix domestiques supérieurs aux prix d'exportation, c'est-à-dire, les prix du monde, moins les frais de manutention, de fret, la perte en cours de transport, etc., et que leurs prix étaient inférieurs d'au moins 3d., aux "taux mondiaux". Ces trois pence sont ce que les Australiens prétendent être la différence entre leurs frais de production et la parité à Londres. On disait que ces frais étaient sensiblement augmentés par des mesures qui ont donné un marché protégé à d'autres branches de l'industrie. L'industrie laitière avait donc droit à une certaine mesure de protection.[7] Le but de la prime n'est pas tant de stimuler les exportations que de pourvoir une indemnité pour les exportateurs et de permettre ainsi une augmentation évaluée de 3d. par livre dans le prix domestique. Pour citer une opinion récente, "le résultat direct du paiement d'une prime d'exportation est que, automatiquement, sans aucun règlement, ni obligation, ni législation, le prix local, par le fonctionnement d'une loi économique, s'élève au niveau du prix d'exportation, plus la prime payée."[8]

Il est probable qu'en considérant les prétentions des champions d'un grand nombre de ces systèmes, il faudrait pour bien faire se représenter ce qui aurait pu se passer si aucun contrôle n'avait été exercé, parce que la plupart de ces systèmes ont fonctionné pendant peu de temps et que pendant ce temps il y a eu une baisse générale de prix.

Le bon fonctionnement de ce système dépend du consentement du gouvernement australien. Par exemple, peu après que ce système est entré en vigueur, il fut nécessaire de relever le tarif sur les importations de beurre. En outre, le consentement du gouvernement est essentiel parce que l'on croit que ce plan est contraire à la loi australienne contre les monopoles.[9]

Il est à noter que la production du beurre a augmenté en Australie. La production était de 273,314,000 livres en 1925-26, tandis qu'en 1931-32 elle avait atteint 390,512,000 livres. Les exportations sur le Royaume-Uni ont augmenté rapidement. Ce fait a aggravé la situation à cause du montant supplémentaire qui devait être payé aux exportateurs. Il faut reconnaître qu'il y a bien des causes différentes qui expliquent cette augmentation dans la production du beurre: les saisons favorables de paissance, les bas prix du grain, l'amélioration des pâturages, l'abandon de la culture du blé et de la production de la laine sur certaines terres pour l'adoption de l'industrie laitière. Les prix relatifs des produits agricoles étaient un autre facteur.

Outre le système Paterson il y a plusieurs Commissions de contrôle d'exportation qui fonctionnent, et notamment la Commission du contrôle des fruits desséchés, la Commission du contrôle des fruits en boîtes, la Commission du contrôle des produits laitiers, qui ont agi comme agences régulatrices sous des pouvoirs statutaires depuis 1925. Il y a en outre la législation d'état qui gouverne la vente des produits primaires et à laquelle nous ferons allusion plus tard.

Disons sous ce rapport qu'une décision récente de la Cour Suprême d'Australie frappe d'illégalité une loi de vente qui entrave la liberté du trafic entre états, laquelle est garantie par la constitution. Cette décision affecte le fonctionnement de la plupart des Commissions de contrôle. Elle implique qu'une législation fédérale et d'Etat est nécessaire et que des Commissions d'Etat peuvent être établies sous la coordination fédérale.[10] En ce qui concerne le beurre on propose que les gouvernements d'Etat adoptent une législation pourvoyant à la fixation des contingents d'exportation par la Commission de contrôle de l'Etat. Nous ne savons pas où en est cette proposition au moment où nous écrivons ces lignes, mais elle nous porte à croire que le système Paterson sera peut-être remplacé avant peu.

[7] Brookens, P. F. Le système Paterson et les prix du beurre en Australie. Journal of Farm Economics, Vol. X, No. 4, octobre 1928, p. 540-43.

[8] Cook, A. J. Le système Paterson, Journal du Ministère de l'Agriculture pour le sud de l'Australie, Vol. XXXVI, No. 3, 15 octobre 1932, p. 323.

[9] Edminster, L. R., Schaben, L. J., et Lynsky, M., F-S 56. Agricultural Price Supporting Measures In Foreign Countries, Bureau de l'économie agricole, Washington, D.C., p. 25.

[10] Forcign Crops and Markets. Bureau de l'économie agricole, Ministère de l'Agriculture des Etats-Unis, Washington, D.C., Vol. 27, No. 1, p. 8.

QUELQUES ASPECTS DE LA SITUATION DES TAXES DE FERME DANS L'ONTARIO[1]

S. C. HUDSON[2]

L'un des problèmes les plus graves peut-être que présente le chaos de la dépression dans lequel l'agriculture est plongée est la situation des taxes de ferme. Les cultivateurs sont incapables de payer leurs taxes; c'est à peine s'ils peuvent vivre sur leurs fermes at les arrérages de taxes se sont accumulés dans presque toutes les municipalités rurales.

TABLEAU 1.—CHIFFRES-INDICES DES TAXES DE FERME DANS L'ONTARIO 1906-1932[1] ET DES PRIX DU GROS DES PRODUITS DE FERME 1913-1932[2]
(1926 = 100)

Année	Taxes de ferme	Prix des produits de la ferme
1906	29.2	—
1907	31.4	—
1908	31.4	—
1909	32.4	—
1910	34.0	—
1911	35.8	—
1912	37.8	—
1913	42.0	62.6
1914	45.1	69.2
1915	51.2	77.7
1916	56.2	89.7
1917	63.3	130.0
1918	71.6	132.9
1919	70.7	145.5
1920	83.3	161.6
1921	88.2	102.8
1922	93.9	86.7
1923	95.3	79.8
1924	95.3	87.0
1925	97.1	100.4
1926	100.0	100.0
1927	104.6	102.1
1928	111.8	100.7
1929	114.4	100.8
1930	115.8	82.3
1931	108.0	56.3
1932	99.1	48.4

[1] Statistique municipale, province de l'Ontario.

NOTE.—Dans l'établissement du chiffre-indice qui précède des taxes de ferme pour l'Ontario, deux cantons dans chacun des 47 comtés ont été choisis. Le territoire généralement connu comme le Nord de l'Ontario et qui se compose des comtés de Cochrane, Kenora, Nipissing, Rainy River, Sudbury, Thunder Bay et Temiskaming, ainsi que beaucoup de territoire non organisé, a été laissé en dehors de cette étude à cause des changements qui ont eu lieu dans les limites municipales au cours de cette période et aussi parce que le développement agricole dans ce territoire est encore dans la phase du pionnier. Comme les taxes de cantons comprennent les villages non incorporés, nous avons pris de préférence les cantons où la population non agricole est au minimum afin de réduire au minimum l'erreur causée par ce détail. Nous avons cherché à éviter autant que possible les cantons qui ont des utilités publiques sur lesquelles des taxes sont prélevées. Il peut se faire que les points mentionnés ci-dessus donnent lieu à quelque divergence d'opinion mais nous croyons qu'un indice établi de cette façon devrait mesurer avec un degré raisonnable d'exactitude la courbe des taxes de ferme.

[2] Prix et indices de prix, Bureau fédéral de la Statistique.

Pour bien comprendre la situation actuelle des taxes agricoles, il est nécessaire de savoir quelque chose de la progression des taxes pendant la période précédente et des rapports qui existent entre cette progression et les autres facteurs économiques. Nous avons établi dans ce but un chiffre-indice des taxes de ferme dans l'Ontario, basé sur les taxes prélevées dans quelque 94 cantons choisis, et pendant la période de

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1906 à 1932. Cet indice qui est présenté au tableau 1, à côté d'un indice des prix du gros des produits de la ferme pendant la période de 1913 à 1932, montre que pendant cette période il s'est produit une augmentation très considérable des taxes de ferme dans l'Ontario, le plus haut point ayant été atteint en 1930. En 1930 les taxes de ferme étaient près de quatre fois plus élevées que celles de 1906 et près de 2.75 fois le chiffre d'avant-guerre ou de 1913. C'est entre 1915 et 1922 que la plus forte augmentation s'est produite. Il y a eu un arrêt dans le taux d'augmentation en 1919 et entre 1922 et 1926, puis une augmentation assez rapide de 1926 à 1929, et depuis ce temps une diminution marquée; l'indice de 1932 est un peu plus bas que celui de 1926. Si l'on compare l'indice des taxes de ferme avec celui du prix du gros des produits de la ferme pour la période de 1913 à 1932, on voit qu'entre 1913 et 1922 les taxes ont traîné le pas derrière les prix de la ferme et qu'elles ne constituaient pas un gros fardeau. Entre 1922 et 1924, les prix ayant baissé brusquement, les taxes sont devenues relativement plus élevées. Cette proportion relative a été modifiée quelque peu en 1925 par une hausse des prix des produits agricoles. Pendant les années 1925 à 1929 les taxes ont augmenté assez rapidement tandis que les prix restaient assez stables. L'effondrement des prix des produits agricoles, de 100.8 en 1929 à 48.4 en 1932, a été suivi par une grosse diminution des taxes en ces deux dernières années. On voit donc que lorsque les prix s'élèvent les taxes s'élèvent moins rapidement et que tant que cette courbe continue les services croissants que demande le public peuvent être payés sans difficulté, mais lorsqu'une baisse de prix se produit la demande de services se maintient et cette demande que l'on ne peut satisfaire que par des emprunts publics provoque souvent, pendant quelques années, une augmentation continue des dépenses publiques, si bien qu'il devient difficile de réduire les taxes à cause des obligations financières dont on s'est chargé les années précédentes.

Une analyse des taxes payées sur 34 fermes choisies arbitrairement dans un canton représentatif du comté de Carleton pendant la période de 1901 à 1931, à intervalles de cinq ans, nous a permis de déterminer les changements dans la répartition du dollar de la taxe du cultivateur. Cette répartition qui est présentée dans le tableau 2, indique l'acheminement qui s'est fait vers l'égalisation des dépenses municipales dans le comté.

TABLEAU 2.—DISTRIBUTION DU DOLLAR-TAXE DU CULTIVATEUR PAR PERIODE DE CINQ ANS 1901-1931

Année	Fins du comté	Fins du canton	Fins scolaires	Total des taxes
1901	24.6	31.4	44.0	100.0
1906	23.8	33.2	43.0	100.0
1911	22.7	31.6	45.7	100.0
1916	33.6	25.2	41.2	100.0
1921	33.2	35.3	31.6	100.0
1926	46.8	23.8	29.4	100.0
1931	57.5	17.8	24.7	100.0

On voit que de 1901 à 1911 près de 44 pour cent des taxes prélevées l'ont été pour des fins scolaires et moins de 25 pour cent pour les fins du comté; en 1916 on voit qu'une proportion croissante a été affectée au comté. Comme l'analyse des taxes de 1931 montre que plus de 57 pour cent du dollar payé en taxe par les cultivateurs vont au comté et que 18 et 25 pour cent servent aux fins du canton et des écoles respectivement, il semble qu'une analyse des déboursés et des sources de revenu du comté devrait indiquer les facteurs qui causent la majeure partie de l'augmentation des taxes.

Pour les fins d'étude des recettes et déboursés du comté, nous avons choisi les comtés unis de Stormont, Dundas et Glengarry qui sont typiques de la majeure partie de l'Ontario.

TABLEAU 3.—COURBE DES DEBOURSES DES COMTES UNIS DE STORMONT, DUNDAS ET GLENGARRY, PAR PERIODES DE CINQ ANS EN TERMES DE LA PERIODE 1902-06.

Détail des dépenses	Pourcentage des déboursés pour 1902-06				
	1907-11	1912-16	1917-21	1922-26	1927-31
Administration	107.1	139.2	187.1	201.4	239.5
Protection et administration de la justice	98.3	111.6	124.0	146.7	211.5
Education	174.6	214.0	357.7	719.2	959.8
Voirie	108.5	51.4	1,286.4	1,211.9	902.1
Assistance publique	1,297.0	1,797.5	647.8	1,273.1	3,603.6
Divers*	78.6	376.3	835.8	323.5	314.2
Totaux	140.8	282.6	1,306.2	1,400.9	1,372.8

*Comprend la taxe sur la terre des non-résidents, les allocations spéciales, l'intérêt, le drainage, la taxe de guerre, les propriétés du comté, etc.

TABLEAU 4.—DISTRIBUTION DES DEPENSES DES COMTES UNIS DE STORMONT, DUNDAS ET GLENGARRY PAR PERIODES DE CINQ ANS 1902-31

Détail des dépenses	1902-06	1907-11	1912-16	1917-21	1922-26	1927-31
Administration	11.3	8.6	5.6	1.6	1.6	2.0
Protection et administration de la justice	19.7	13.7	7.8	1.9	2.1	3.0
Education	48.7	60.4	36.9	13.3	24.9	30.4
Voirie	7.4	5.7	1.4	72.8	63.9	48.5
Assistance publique	.5	4.6	31.9	2.5	4.6	13.2
Subsides spéciaux	2.3	2.5	6.5	4.5	.7	.4
Taxe de guerre	—	—	7.8	1.7	—	—
Divers*	10.1	4.5	2.1	1.7	2.2	2.5
Totaux	100.0	100.0	100.0	100.0	100.0	100.0

*Comprend la taxe sur les terres des non-résidents, les intérêts, le drainage, les propriétés du comté, etc

Les tableaux 3 et 4 dans lesquels les déboursés des comtés unis de Stormont, Dundas et Glengarry, de 1902 à 1931, sont analysés par périodes de cinq ans, montrent l'importance relative de chaque déboursé pour chaque période. L'administration, la protection et l'administration de la justice, et l'instruction étaient les principaux comptes des déboursés, les services supplémentaires dont les comtés se sont chargés pendant les dernières périodes ont réduit les deux premiers de ces comptes à une insignifiance relative. Pendant toute la période, cependant, l'instruction est restée l'un des principaux frais et n'a été dépassée que par la construction des chemins après la période de 1917-21.

Pendant la période de 1912-16 les déboursés pour l'assistance publique, qui comprend le soin des indigents et des aliénés, et les subsides aux hôpitaux et autres institutions charitables, ont été relativement élevés à cause de la forte dépense de capital nécessitée pour l'établissement d'un asile industriel et ces chiffres peuvent induire en erreur sous ce rapport. Pendant la même période des subsides spéciaux qui comprennent des allocations pour fins patriotiques, et des taxes spéciales de guerre formaient une partie relativement considérable des déboursés totaux.

Après la guerre, en raison du progrès anormal qui s'est produit dans le domaine des transports par automobile, il y a eu une demande générale pour l'amélioration des chemins. La conséquence de cette demande se voit dans le fait que pendant la période 1917 à 1921 plus de 70 pour cent des déboursés de comté ont été pour la construction des chemins. Il y a eu une légère diminution pendant la période suivante, tandis que dans la période plus récente, les déboursés pour la construction des chemins constituaient environ 48 pour cent des déboursés totaux.

La création de nouveaux services sociaux comme l'assurance-vieillesse, les allocations aux mères et les dépenses croissantes pour les soins des indigents, causées par la situarion économique, se voient dans l'augmentation des déboursés pour l'assistance publique en ces deux dernières périodes.

Les changements dans les sources de revenu d'où proviennent les fonds pourvus pour ces déboursés supplémentaires sont indiqués au tableau 5.

TABLEAU 5.—DISTRIBUTION DES RECETTES DES COMTES UNIS DE STORMONT, DUNDAS ET GLENGARRY PAR PERIODES DE CINQ ANS 1902-31

Source du revenu	1902-06	1907-11	1912-16	1917-21	1922-26	1927-31
Taux des comtés	73.6	69.2	72.7	60.5	54.2	66.7
Subsides du gouvernement provincial						
Administration de la justice	6.7	3.6	3.2	.5	.5	.8
Education	15.0	23.6	20.2	10.6	12.8	12.3
Voirie	—	—	—	26.6	30.9	16.0
Autres sources*	4.7	3.6	3.9	1.8	1.6	4.2
Totaux	100.0	100.0	100.0	100.0	100.0	100.0

*Comprend les permis, les amendes, les droits des bureaux d'engistrement, les taxes sur les terres des non-résidents, le fonds de jury de la cour de division, diverses remises, asiles, hôpitaux, etc.

Tandis que pendant la période de 1902-1906 près de 74 pour cent des revenus du comté venaient de la la taxe générale sur les propriétés, prélevée par les municipalités qui constituent le comté, cette proportion a diminué pendant les années suivantes, si bien qu'elle n'était plus que de 54 pour cent de 1922 à 1926. Principalement à cause de la diminution dans les subsides provinciaux pour la voirie pendant la période suivante, la proportion du revenu total contribué par les cantons a été portée à environ 67 pour cent. Cependant, les données présentées dans ce tableau indiquent un changement vers la distribution provinciale des dépenses municipales.

Il semble donc que la situation actuelle des taxes de ferme soit le résultat normal de l'effondrement des prix, venant après une période de prix élevés pendant laquelle une demande insatiable de services supplémentaires s'est développée. Il semble qu'elle soit due principalement à un niveau de prix instable ou en déflation.

LE COUT DE LA FABRICATION DU FROMAGE DANS L'ONTARIO

J. F. Booth[1] et C. V. Parker[2]

Cet article est le premier d'une série traitant de l'aspect économique de la fabrication du fromage. Les données qu'il renferme ont été recueillies en l'automne de 1932, et s'appliquent aux opérations en 1931, de 125 fromageries de l'Ontario. Une enquête semblable, portant sur 120 fabriques de la province de Québec, a été entreprise en même temps et les résultats en seront présentés dans un autre numéro de *l'Economiste*.

Dans la conduite de cette enquête, les agents des Divisions de l'industrie laitière et de l'économie du Ministère fédéral de l'Agriculture ont coopéré avec les autorités provinciales. Dans le Québec, ces autorités étaient la Division de l'industrie animale et la Division de l'économie rurale du Ministère de l'Agriculture. dans l'Ontario, la Division de l'industrie laitière du Ministère provincial de l'Agriculture et le Service de l'économie du Collège d'Agriculture de l'Ontario.

Nous ne traitons dans cet article que des frais de fonctionnement des fabriques; d'autres phases seront passées en revue plus tard.

L'industrie fromagère de l'Ontario a de nombreux problèmes à résoudre dont le plus important peut-être, parmi tous ceux qui affectent les frais de production, est le chiffre décroissant des affaires. La première fromagerie s'est établie dans le comté d'Oxford, Ontario, en 1864. L'industrie s'est ensuite développée rapidement jusqu'au commencement du siècle actuel, puis elle a décliné graduellement depuis 1904 dans l'Ontario et, en fait, dans tout le Canada. En 1931, l'Ontario comptait 714 fabriques produisant un peu plus de 84 millions de livres de fromage. Ce chiffre représente une diminution de 36.4 pour cent sur celui de 1900, qui était de près de 132 millions de livres.

Cette diminution s'explique par la demande croissante de lait pour la consommation en nature dans les grands centres urbains, et par le développement de la fabrication d'autres produits laitiers; à ces causes il convient d'ajouter l'amélioration des moyens de transport, des chemins, des moyens de manutention, etc. L'effet net de cette combinaison de circonstances a été une concurrence croissante et un chiffre décroissant d'affaires pour les fromageries, qui ne pouvaient que malaisément se plier à ce changement de conditions et tenir tête à la concurrence que leur faisait l'emploi du lait pour d'autres usages.

Le lait destiné à la production du fromage doit être livré tous les matins; on exige qu'il soit propre et frais. Dans l'établissement des fabriques, il a donc toujours été nécessaire de tenir compte de la distance à laquelle le lait doit être transporté. Dans la première période de développement, et même encore dans la plupart des régions, ceci signifie la distance à laquelle un patron doit transporter son lait tous les matins dans un véhicule tiré par des chevaux, et c'est pourquoi la région desservie par une fabrique, spécialement dans l'est et le centre de l'Ontario, est relativement faible et la distance entre les fabriques n'est souvent que de quelques milles.

Nous espérons que cet exposé des frais de production dans les fabriques de différentes capacités sera utile à ceux qui s'intéressent à l'industrie fromagère de l'Ontario.

Frais de Fabrication du Fromage

Dans les tableaux ci-joints les frais sont présentés suivant deux modes de calcul. Nous n'avons pas tenu compte des frais du charriage du lait à la fabrique ou du fromage sortant de la fromagerie.

Dans la première méthode, les frais ont été calculés au point de vue du coût pour le patron. Ils représentent les "taux" actuellement prélevés, c'est-à-dire les taux de fabrication prélevés par les propriétaires particuliers et les déductions que font les

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fromageries à patrons sur le prix de vente du fromage. En outre, les frais d'organisation des patrons—salaires, papeterie et épreuves du lait—ont été ajoutés aux taux pour les fabriques appartenant à des particuliers. La méthode I traite donc des frais tels qu'ils sont connus au patron. Elle représente jusqu'à un certain point ses déboursés annuels directs.

Dans le tableau 1 les fabriques sont classées suivant le nombre de tonnes de fromage qu'elles produisent, et les frais pour chaque groupe sont donnés suivant les meilleurs modes de calcul. Le coût moyen par livre pour la méthode I était de 1.94c. en 1931. Il a varié de 2.34c. pour les petites fabriques à 1.75c. pour les plus grandes.

TABLEAU 1.—COMPARAISON DES TAUX ACTUELS ET DE FRAIS TOTAUX ET DE L'EFFET DU VOLUME SUR LE COUT DE LA FABRICATION DU FROMAGE

Capacité de la fabrique	Méthode 1. Taux comptés		Méthode 2. Coût du fonctionnement y compris les frais totaux		Différence entre les deux méthodes
	Nombre de fabriques	Coût par livre	Nombre de fabriques	Coût par livre	
(tonnes de fromage)					
Moins de 25	4	2.34	6	2.98	.64
25 – 49.9	29	2.09	35	2.58	.49
50 – 74.9	25	2.13	37	2.36	.23
75 – 99.9	8	2.12	11	2.14	.02
100 – 124.9	6	1.87	12	2.12	.25
125 – 149.9	5	1.78	7	2.00	.22
150 – 174.9	7	1.78	8	1.96	.18
175 et plus	6	1.75	9	1.22	.07
Toutes les fabriques	90	1.94	125	2.16	22

Nous avons constaté, en examinant les taux computés d'après la méthode I, que tous les frais ne sont pas entièrement couverts. En général, les propriétaires de fabriques n'ont pas fait une réserve suffisante pour la dépréciation en calculant les taux de fabrication et leur part de travail a été réduite d'autant. On peut en dire autant des fabriques appartenant aux patrons; les patrons ont perdu une partie de leur capital en ne couvrant pas suffisamment la dépréciation. La pratique générale dans les fromageries est de couvrir les frais de remplacement à mesure qu'ils se produisent, mais en 1931, lorsque l'on réduisait les dépenses, beaucoup de propriétaires de fabriques ont sans doute dépensé moins que d'habitude au compte capital. Nous avons constaté que les déboursés pour couvrir la dépréciation (savoir, nouveau matériel pour fins de remplacement et reconstruction des bâtiments), ne se montaient qu'à 25 pour cent des frais estimés de dépréciation pour cette année-là. Quelques propriétaires de fabriques ont dépensé plus que d'autres et naturellement les taux de dépréciation varient dans les différentes fabriques. Cependant, pour mettre tous les établissements sur la même base et également pour prendre en considération tous les frais compris dans les opérations de la fabrique, la méthode II a été adoptée. Ces frais sont aussi présentés au tableau 1.

Pour les deux genres de fabriques à patrons et privées, les frais computés par la méthode II se classent sous trois catégories: (1) les frais de fonctionnement (laissant de côté toutes les dépenses au compte capital et les salaires du fabricant) présentés sur la même base pour les deux types de fabriques; (2) l'intérêt sur le placement, compté à 5 pour cent; la dépréciation sur les bâtiments en bois à 5 pour cent, sur les structures de brique ou de pierre à 3 pour cent de la valeur actuelle; quant au matériel la dépréciation a été calculée sur la base "des années d'emploi futur"; la valeur actuelle et les années d'emploi futur pour les principaux éléments du matériel

ont été déterminées; en divisant la valeur actuelle par le nombre d'années d'emploi futur nous avons obtenu un chiffre de dépréciation pour l'année de l'enquête; (3) les salaires des fabricants ont été computés en déduisant leurs dépenses des montants qu'ils reçoivent pour la fabrication du fromage.

Revenons au tableau 1; on voit que le taux moyen par livre pour la fabrication du fromage est de 2.16c. lorsque l'on tient compte de tous les frais. Une comparaison des taux d'après les deux méthodes de calcul montre que les plus grandes fabriques couvraient tous les frais plus complètement que ne faisaient les petites. En dehors

TABLEAU 2.—COUT PAR LIVRE DE FROMAGE DES DEBOURSES PRINCIPAUX D'APRES LA CAPACITE DES FABRIQUES

Principaux déboursés	Capacité de la fabrique — Cents par livre de fromage								Toutes les fabriques
	Moins de 25 tonnes	25 à 49..9	50 à 74..9	75 à 99..9	100 à 124.9	125 à 149.9	150 à 174.9	175 à plus	
Boîtes	.297	.286	.287	.270	.345	.312	.315	.321	.306
Fournitures	.304	.304	.268	.280	.255	.223	.274	.248	.265
Combustible	.310	.211	.241	.235	.255	.255	.275	.235	.248
Taxes et assurance	.093	.103	.089	.083	.064	.062	.054	.051	.072
Salaires d'organisation	.147	.082	.083	.084	.055	.062	.042	.063	.069
Main-d'oeuvre louée et pension	.001	.113	.188	.190	.374	.350	.350	.352	.281
Salaire du fabricant	1.245	.974	.810	.678	.522	.489	.405	.414	.628
Autres déboursés de la fabrique	.048	.041	.038	.038	.039	.038	.032	.041	.039
Réparations	.073	.088	.083	.086	.127	.073	.060	.077	.080
Intérêt	.187	.180	.167	.157	.137	.148	.148	.086	.144
Dépréciation	.305	.286	.252	.271	.218	.212	.193	.125	.218
Dépenses brutes	3.010	2.665	2.505	2.374	2.392	2.223	2.184	2.055	2.349
Crédit pour le petit lait	.030	.088	.143	.229	.271	.224	.219	.231	.194
Dépenses nettes	2.98	2.58	2.36	2.14	2.12	2.00	1.96	1.82	2.16
Nombre de fabriques	6	35	37	11	12	7	8	9	123

Note: Dans les frais du traitement du produit du petit lait, il a été convenu de considérer la partie des recettes reçues par le fabricant comme une charge inscrite au compte de la fabrique. Pour compenser cette charge et déterminer ainsi le coût de fabrication du fromage, la partie qui restait des recettes (c'est-à-dire la somme reçue par les patrons), a été déduite des frais totaux. Pour obtenir le coût par livre, le déboursé net ainsi obtenu a été divisé par la quantité de livres de fromage fabriqué.

TABLEAU 3.—VARIATION DANS LES FRAIS DE FABRICATION DU FROMAGE PAR LIVRE

Frais (cents par livre)	Nombre dans la catégorie	Moyenne calculée pour chaque catégorie	Pourcentage de distribution
Moins de 1.60	1	1.59	.8
1.60 – 1.74	4	1.65	3.2
1.75 – 1.99	19	1.87	15.2
2.00 – 2.24	29	2.13	23.2
2.25 – 2.49	34	2.35	27.2
2.50 – 2.74	19	2.61	15.2
2.75 – 2.99	11	2.85	8.8
3.00 – 3.24	7	3.11	5.6
3.25 et plus	1	3.27	.8
Total ou moyenne	125	2.16	100.0

du plus petit groupe de fabriques qui avaient un coût de 2.34c. par livre, les taux d'après la méthode I (frais actuels comptés) étaient d'environ 2⅛c. par livre pour les fabriques qui produisaient moins de 100 tonnes de fromage. Il y a une grosse diminution dans les taux de fabrication prélevés entre le groupe de 75-99.9 tonnes et le groupe de 100-124.9 tonnes. La diminution est moins forte dans le groupe suivant et à partir de ce dernier groupe les taux moyens sont restés à peu près les mêmes.

Les taux computés d'après la méthode II étaient beaucoup plus élevés que les taux réels dans les trois premiers groupes de fabriques de même capacité, mais ils étaient à peu près les mêmes pour le groupe de 75-99.9 tonnes. Par conséquent, si l'on prélève un taux de 2–2⅛c, les frais totaux ne peuvent être couverts que si la production atteint ou dépasse 75 tonnes. De même, si l'on compte 1.87 à 1.75c par livre, tous les frais ne peuvent être couverts que si l'on produit plus de 175 tonnes de fromage.

L'effet de la quantite sur les frais de production

Tout en représentant les différences de frais entre les méthodes I et II, le tableau 1 montre également l'effet de la quantité sur les frais de production. Le coût total pour les fabriques produisant moins de 25 tonnes de fromage était de 2.98c par livre. A mesure que la quantité produite augmente, le taux ou le coût par livre diminue. Dans le groupe à plus forte production, 175 tonnes et plus, le taux était de 1.82c. La diminution totale de frais a été de 1.16c par livre. Ces chiffres nous montrent que les frais de fabrication sont réglés dans une grande mesure par la quantité de fromage produite.

Les frais présentés au tableau 1, méthode II, sont donnés beaucoup plus en détail au tableau 2. Ici, nous voyons clairement l'effet de la quantité sur les différents déboursés. Le coût par livre attribuable aux boîtes, aux fournitures et au combustible, n'a pas, pour des raisons plus ou moins apparentes, diminué sensiblement en proportion de l'augmentation dans la capacité de la fabrique. Cependant, dans les plus grandes fabriques, il y a eu une diminution bien nette par livre lorsque l'on prend en considération ce que l'on appelle les frais fixes—taxes, assurance, intérêt et dépréciation. Quoique les frais de la main-d'oeuvre louée (autres que le fabricant) aient augmenté avec le volume de la production, le montant payé aux fromagers, computé sur une base par livre, a diminué rapidement à mesure que le volume de la production augmentait. On voit que les plus grandes fabriques se tiraient beaucoup mieux d'affaire en ce qui concerne le plus gros déboursé dans les frais de fabrique.

Les frais sont représentés d'une façon un peu différente au tableau 3. Ici, les fabriques sont arrangées par groupes, suivant les frais de fonctionnement, et l'on remarque que les extrêmes sont de 1.59c par livre dans une fabrique et de 3.27c dans une autre. Cette différence était due presque entièrement au fait que la fabrique à bas prix a fait un chiffre d'affaires beaucoup plus considérable. Cinquante pour cent environ des fabriques se trouvaient dans le groupe représenté par des frais variant de 2.0c à 2.50c par livre.

Resume et conclusions

Les frais de fabrication du fromage se rattachent intimement à la production. L'écart entre les fabriques où la production coûte le plus cher et celles où elle coûte le moins cher, est de 1.68c par livre, soit l'équivalent d'environ 15c par 100 livres de lait. Aux prix qui avaient cours en 1931, ceci représente une différence d'environ 20 pour cent. La différence entre les frais encourus par le groupe de fabriques produisant moins de 25 tonnes annuellement et ceux des fabriques dont la production est de 175 tonnes par année, est de 1.16c, soit environ 10c par 100 livres de lait.

On a obtenu cette grosse réduction dans les frais en tirant le meilleur parti possible de la main-d'oeuvre, de l'installation et du matériel, et comme, dans cette industrie, tous les bénéfices que l'on obtient de cette façon se réfléchissent directement dans le prix payé pour le lait, il semble qu'il soit désirable d'augmenter autant que possible le chiffre d'affaires. Le meilleur moyen de le faire dans bien des cas serait

d'amalgamer les districts de fabriques et de fermer les fabriques inutiles. Ceci nécessiterait par contre de plus longs charrois par les patrons, ou, si les conditions le permettaient, l'organisation de routes à lait.

Lorsque les conditions des chemins ne permettent pas le charriage de gross s charges, comme celles qui seraient nécessaires si l'on organisait des routes à lait, et lorsque les patrons ne désirent pas charrier leur propre lait sur de plus longues distances, il faudrait obtenir une augmentation de volume en allongeant la période de fonctionnement, en augmentant le nombre de vaches par troupeau et la production par vache ou en détournant le lait qui va maintenant aux laiteries, aux beurreries ou aux condenseries.

Nous savons qu'il y a d'autres choses à considérer dans cette question de l'amalgamation des fabriques. Quoi qu'il en soit, il y a bien des cas où il serait avantageux d'agrandir le district desservi par une fabrique et les patrons agiraient sagement en étudiant soigneusement ce côté de la question.

REUNION DU COMITE CONJOINT FEDERAL-PROVINCIAL ECONOMIQUE DE L'ONTARIO

Une réunion du Comité conjoint fédéral-provincial en économie agricole pour l'Ontario a été tenue à Toronto les 27 et 28 novembre. C'était là la troisième réunion de ce Comité, qui avait été constitué en 1931 à une conférence convoquée par les Ministres de l'Agriculture des départements respectifs, pour chercher les moyens de résoudre les problèmes urgents dans lesquels se débattait l'agriculture. L'un des buts du Comité était de mettre fin au double emploi des efforts. Les différentes agences qui s'intéressent à l'économie agricole et aux domaines qui s'y rapportent ont passé en revue ce que l'on faisait et étudié les projets qui devraient être entrepris.

Les travaux de ce Comité ont encore resserré la collaboration qui existait entre les Ministères de l'Agriculture, le Bureau de la Statistique, les Universités et les Collèges qui s'intéressent à l'agriculture dans l'Ontario. Ceux qui assistaient à la dernière réunion et les organisations qu'ils représentaient étaient les suivants:

W. B. Somerset, Ontario Marketing Board, Toronto; Geo. Barr et J. A. Carroll, Ministère de l'Agriculture, Toronto; Professeurs F. C. Hart et C. W. Riley, Collège d'Agriculture de l'Ontario, E. E. Rielly, Université Western et W. R. Drummond, Université de Toronto; Dr. J. F. Booth, J. Coke, R. L. Wheeler, P. E. Light, Ministère fédéral de l'Agriculture; Dr T. W. Grindley, Bureau fédéral de la Statistique.

L'AUSTRALIE PREPARE DE NOUVELLES METHODES DE VENTE POUR RESPECTER LES ACCORDS MONDIAUX SUR LE BLE

Un article paru récemment dans "Foreign Crops and Markets" prétend qu'aucune mesure législature ne sera nécessaire en Australie pour faire respecter l'accord international du blé. Une proclamation sera lancée, interdisant l'exportation non autorisée du grain ou de la farine. Tous les exportateurs devront se procurer un permis, et on leur accordera des contingents spécifiques d'exportation, basés sur la quantité qu'ils ont expédiée dans le passé. Les permis d'exportation seront sujets à certaines conditions. "Chaque exportateur autorisé devra entreprendre d'acheter des cultivateurs, tant qu'ils auront du blé à vendre, ou de réserver pour les cultivateurs et de faire des avances sur ces stocks, un boisseau de blé pour chaque deux boisseaux qu'il est autorisé à exporter pendant l'année allant du 1er août 1933 au 31 juillet 1934." Les exportateurs qui achètent plus qu'ils ne peuvent exporter pendant cette période seront autorisés à exporter librement l'année suivante, mais on prendra ces reliquats en considération en fixant le contingent individuel d'exportation pour 1934-35. Si les marchands n'offrent pas la parité mondiale pour tout le surplus exportable de blé, alors la Fédération australienne achètera elle-même le blé.

NOTES

Des dispositions préliminaires tendant à l'établissement d'une échelle mondiale de prix minimums pour le blé doivent être présentées à la Commission internationale du blé le 22 janvier 1934 par le comité des ventes de cette organisation. Le Comité se bornera à indiquer quelles doivent être les différences de prix pour les différentes espèces de blé, et ce sera à la Commission à fixer les prix réels. Les délégués des grands pays producteurs de blé sont convaincus qu'une échelle minimum est nécessaire pendant deux ou trois mois pour que le blé puisse sortir de la position inférieure qu'il occupe actuellement sur les marchés du monde.

Le Journal du Ministère de l'Agriculture, décembre 1933, fait rapport que la Chambre de vente du houblon a évalué des échantillons représentatifs de la récolte de 1933. Le marché s'est ouvert le 30 octobre et la Chambre a pu vendre des quantités considérables aux prix établis. Cependant, l'industrie de la brasserie a déposé une plainte formelle contre les opérations de la Chambre, et la question a été référée à un comité d'enquête.

Le Bureau d'économie agricole, Washington, D.C., déclare qu'au 1er décembre "les prix de ce que l'on peut appeler les matières premières agricoles, comme les graines et le coton, se sont améliorés en ces dernières semaines. Ce sont généralement des indices sensibles, et leur mouvement ascensionnel est important. Par contre, les boeufs et les porcs, qui représentent des produits plus finis, ont baissé, et ces marchés sont dans un état extrêmement faible. La moyenne générale des prix des produits agricoles s'est légèrement relevée le mois dernier, tandis que le prix des choses que les cultivateurs achètent sont restés à peu près inchangés.

Le Dr W. Allen, du Service d'exploitation des fermes de l'Université de la Saskatchewan, a été nommé Commissaire royal pour enquêter dans les problèmes de la vente du lait en Saskatchewan.

La vente coopérative a été le sujet d'une longue discussion à la Conférence annuelle d'extension, qui a été tenue au Collège d'agriculture, Truro, Nouvelle-Ecosse, les 2-5 janvier 1934.

On se prépare en Australie à autoriser par législation fédérale l'adoption d'un nouveau système de vente du beurre en remplacement du système Paterson qui fonctionne depuis plusieurs années et qui s'est montré insuffisant dans les conditions actuelles. D'ailleurs, on a décidé que la loi du contrôle des produits laitiers est ultra vires, et la nouvelle législation a pour but de surmonter les objections que présentait l'ancienne méthode de contrôle.

RESUME DES ARTICLES PUBLIES EN ANGLAIS DANS CE NUMERO

QUELQUES OBSERVATIONS CONCERNANT LES RECHERCHES SUR L'ELEVAGE EN GRANDE BRETAGNE. R. D. Sinclair, Université de l'Alberta, Edmonton, Alta.

L'auteur donne un aperçu de l'organisation des recherches en matière d'élevage en Grande Bretagne. Le développement des recherches dans ce champ est un développement d'après-guerre. Une grande partie du travail fondamental a été accomplie en peu de temps en raison de la flexibilité du système de recherches qui présente les caractères suivants: (1) Organisation d'Instituts de recherches dans les diverses sciences biologiques. (2) Coopération étroite entre les diverses institutions travaillant à des problèmes plus ou moins connexes.

EFFET DES ENGRAIS CHIMIQUES SUR LE RENDEMENT ET LA COMPOSITION DES RECOLTES SUR LES SOLS FORESTIERS DE L'ALBERTA. R. E. McAllister, Université de l'Alberta, Edmonton, Alta.

L'auteur rapporte l'effet des divers engrais chimiques sur les rendements et la composition de diverses récoltes en sols forestiers podsoliques. L'emploi de légumineuses comme engrais vert a produit un accroissement de rendement du blé allant jusqu'à quatre fois le rendement des témoins. En général lorsque des accroissements importants de rendement furent obtenus au moyen d'engrais chimiques la teneur en azote et en phosphore a été réduite, sauf la teneur en azote du trèfle qui a augmenté avec le rendement. L'avoine et l'orge, qu'elles aient ou non été fertilisées, ont accusé un pourcentage de matières azotées bien au-dessous de la normale.

INFECTION DU BLE DE PRINTEMPS PAR DES SPORES DE CARIE AYANT HIVERNE DANS LE SOL. W. F. Hanna et W. Popp, Laboratoire fédéral de recherches sur la rouille, Winnipeg, Man.

Les résultats d'essais de germination de spores de carie (*Tilletia tritici*) ayant passé l'hiver en terre en 1932–1933 ont été semblables à ceux de l'année précédente. Des spores provenant d'épis infectés de blé Mindum ayant passé l'hiver à la surface du sol ont mieux germé que les spores provenant d'épis enterrés. A l'automne 1932, des épis cariés, des grains cariés et des spores de carié passées au tamis furent appliqués sur trois parcelles. Du blé Cérès traité à la formaline fut semé sur ces parcelles au printemps 1933 et produisit un certain nombre de pieds cariés. Quelques-unes des plantes croissant spontanément sur les parcelles ayant reçu les épis et les grains cariés furent aussi infectées.

REVUE

RAPPORT DE LA COMMISSION ROYALE SUR LES SYSTEMES BANCAIRE ET MONETAIRE AU CANADA, 1933. J. O. Patenaude, Imprimeur du Roi, Ottawa, prix 50 cents.

Tout le problème que la Commission a été chargée d'étudier peut se résumer comme suit: Quelle est la situation économique générale au Canada? Les systèmes financiers et bancaires qui existent actuellement sont-ils suffisamment organisés pour tenir tête aux problèmes monétaires et financiers auxquels cette situation donne naissance?

Après une revue complète de la situation, la Commission à la majorité recommande "qu'une banque centrale soit immédiatement établie au Canada, et elle recommande à l'unanimité qu'une enquête soit instituée par le Gouvernement fédéral, de préférence avec la collaboration des Gouvernements provinciaux, pour étudier les organisations existantes de crédit rural en vue de préparer un système qui sera soumis au Parlement."

Dans le dernier paragraphe du chapitre sur le crédit rural, la Commission déclare que les matériaux mis à sa disposition au cours de l'enquête n'étaient pas suffisants pour permettre de faire une recommandation spécifique sur la forme précise que cette organisation pourrait prendre. Les preuves présentées ont convaincu la Commission que le besoin de cette agence est réel.

NOTES AND NEWS

NATIONAL ADVISORY COMMITTEE ON AGRICULTURAL SERVICES EXECUTIVE MEETINGS

In the August, 1933, issue of *Scientific Agriculture* an account was given of the Regina meeting of the National Advisory Committee on Agricultural Services. It was stated that an Executive of the National Committee had been appointed consisting of nine men who are in a position to meet at fairly frequent intervals. The function of the Executive is to review the progress of joint committees working on various problems involving the different services, and to appoint any committees where necessary.

The first meeting of the Executive was held in the office of Dr. H. Barton, Deputy Minister of Agriculture, on October 19th. There was a full attendance as follows: Dr. H. Barton, Dr. G. I. Christie, Rev. Fr. Leopold, Dr. W. J. Black, Mr. J. B. Fairbairn, Dr. E. S. Archibald, Dr. L. P. Roy, Dr. R. Newton, Mr. H. L. Trueman. Dr. L. P. Roy represented Mr. J. A. Grenier, Deputy Minister of Agriculture for Quebec. Dr. H. Barton was elected Chairman of the Executive and Mr. H. L. Trueman was elected Secretary.

A discussion took place on the relation of the Executive to the "special standing committees" which it is authorized to appoint according to the resolution adopted at the National Conference on Agricultural Services in Regina in 1933. It was agreed that these committees should be small committees assigned to regional or national problems and should be responsible directly to the Executive of the National Advisory Committee; the function of these standing committees is to co-ordinate the activities of problem committees now in existence and to arrange for the appointment of additional problem committees where needed. It was also agreed that the name of each committee should indicate as far as possible its field, and that the scope of activities of each committee should be defined by the Executive of the National Advisory Committee. It was further agreed that a survey of the personnel and activities of existing problem committees be made at once. The Executive members will then be asked to study the activities of the various committees with a view to determining what problems are most urgent.

Following the recommendation of the National Committee, small committees of three men, with power to add to their number, were appointed to deal with problems arising out of the Conference at Regina as follows:

Barley Committee—Prof. T. J. Harrison (Chairman), Board of Grain Commissioners for Canada, Winnipeg; Mr. L. H. Newman, Central Experimental Farm, Ottawa; and Dr. O. S. Aamodt, University of Alberta, Edmonton. The function of this committee is to bring up to date information collected by the former joint committee on barley, and to make recommendations for carrying out further co-operative projects.

Committee on Seed Grain—Mr. L. H. Newman (Chairman), Central Experimental Farm, Ottawa; Mr. W. T. G. Weiner, Canadian Seed Growers' Association, Ottawa, nd Dr. G. P. McRostie, University of Manitoba, Winnipeg. This committee was set up in response to a resolution sponsored by the Canadian Seed Growers' Association asking for further co-operative effort on the part of departments and commercial organizations to increase the use of better seed. The extension project in the use of better seed carried on by the Searle Grain Company and other commercial companies in co-operation with departments was placed under the direction of this committee.

Committee on Publication of Research—Dr. G. I. Christie (Chairman), Ontario Agricultural College, Guelph; Rev. Fr. Leopold, Oka Agricultural Institute, La Trappe, P.Q.; and Dean A. M. Shaw, University of Ssakstchewan, Saskatoon. It was suggested that Dr. E. S. Archibald, Central Experimental Farm, Ottawa, Dr. R; Newton, National Research Council, Ottawa; and Mr. H. L. Trueman, Canadian Society of Technical Agriculturists, Ottawa, be recommended as additional members. This committee was asked to survey the facilities for the publication of agricultural research and experimentation now available in Canada and to make definite recommendations or the financing of the technical journal, *Scientific Agriculture*.

The second meeting of the Executive was held on November 22nd in the office of Mr. J. B. Fairbairn, Deputy Minister of Agriculture for Ontario. There was again a full attendance of the members. Reports of activities were received from the Committee on Seed Grain and the Barley Committee.

A discussion took place on the co-ordination of research and investigational work in cold storage. It was pointed out that there is at present no committee through which various institutions and departments conducting cold storage investigations can pool their information and plan co-operative projects. It was decided that before any such committee should be appointed there should be a survey conducted of work under way, and opinions gathered as to the need and functions of such a committee This survey is now proceeding.

Acting upon recommendations from both the Toronto Conference and the Regina Conference, and from the Canadian Society of Agricultural Economics, the Executive discussed the advisability of establishing an agricultural outlook service for Canada. It was agreed that it is highly desirable to present consolidated information on the farm products marketing picture in a form readily understandable by farmers. It was intimated that this information would not by any means solve the problems of production and marketing, but that in many cases it might form the basis for wider and better co-ordinated policies for certain farm products. The following committee was appointed with power to add to their numbers:

Agricultural Outlook Committee—Dr. J. F. Booth (Chairman), Dominion Department of Agriculture, Ottawa; Dr. T. W. Grindley, Department of Trade and Commerce, Ottawa; and Dr. J. E. Lattimer, Macdonald College, P.Q. This committee is now functioning and an agricultural outlook statement is under preparation.

Before closing the Executive meeting in Toronto a lengthy discussion took place on the relation of agricultural services to commercial marketing facilities, and questions such as national marketing conferences and marketing legislation were thoroughly discussed.

C.S.T.A. CONVENTION AT MACDONALD COLLEGE

At a meeting of the Board of Directors of the C.S.T.A. at Toronto during the Royal Winter Fair, it was definitely decided to accept the invitation of the Quebec Government to hold the 1934 convention in the Province of Quebec. As invitations had been received from several of the Quebec sections, it was finally decided to meet at Macdonald College and Oka Agricultural Institute and also at Quebec City. The Canadian Seed Growers' Association is planning to meet during the third week of June at Macdonald College and Oka and the C.S.T.A. expects to follow with its convention during the fourth week of June. Affiliated groups are already working on their programmes and a strong central committee and special committees have been appointed. An enthusiastic meeting was held at Macdonald College on January 18th, details o which will be given in the February issue.

M. B. DAVIS APPOINTED DOMINION HORTICULTURIST

Mr. M. B. Davis, B.S.A., M.Sc., has been appointed Dominion Horticulturist in the Dominion Experimental Farms Branch, Dominion Department of Agriculture. This position recently became vacant on account of the passing of Dr. W. T. Macoun.

Mr. Davis has the years of service, training and experience which admirably fit him for this responsible position. He was born in Yarmouth N.S.,, and received his early education in the public and high schools of his native town, graduating from Macdonald College, (McGill) with the degree of B.S.A. in 1912.

On graduation he became manager of Sunnyside Farm, Ltd., Bridgetown, Nova Scotia. He took an active interest in co-operative marketing, becoming a director of the Bridgetown Fruit Company, and was a member of the committee of five which planned the organization of the present United Fruit Companies of Nova Scotia, Ltd. He was made the first secretary of that organization.

Mr. Davis was appointed Assistant to the Dominion Horticulturist in 1914. He served overseas with the first McGill Battery from May 1916 to December 1918. He was appointed Chief Assistant in the Division of Horticulture in 1919 on his return from overseas.

In 1922, he took post graduate work at the University of Minnesota for one quarter and in 1929-30 spent one year in England, mainly at the University of Bristol from which he received the degree of M.Sc. Mr. Davis is the author of a number of popular bulletins and scientific publications and during his tenure of office has been in charge of fruit breeding work at the Central Experimental Farm. He has also specialized in plant nutritional work with horticultural crops. His wide experience and exceptional training make him well qualified to render fine service to Canadian Horticulture.

BOWLING TOURNAMENT

Following a custom inaugurated two or three years ago, some of the C.S.T.A. locals in Ontario and Quebec have conducted a five-pin bowling tournament. This year scores were kept during the week of December 11th. Three locals participated with the following results:

1. Average Scores for whole evening:

Montreal City	8 players	Average for 3 games	182.791
Toronto	36 "	" " 2 "	178.6
Ottawa	24 "	" " 3 "	163.7

2. Average Scores on basis of 2 games:

Montreal City	8 players	Average for 2 games	197.187
Toronto	36 "	" " 2 "	178.6
Ottawa	24 "	" " 2 "	176.2

3. High individual scores:

Toronto, C. H. Hodge—High Single Game.....305
C. H. Hodge—High Two Games.....305
Ottawa, P. W. Chepeswick—High Single Game.....287
P. W. Chepeswick—High Two Games.....486
Montreal City, B. Leslie Emslie—High Single Game.....252
O. R. Evans—High Two Games.....476

The honours for this round have gone to Montreal, without even having to count the additional decimal places so kindly furnished by their secretary in his compilations. The low individual scores were also furnished by each secretary, but to avoid possible libel suits these are not being printed in *Scientific Agriculture*. It is perhaps sufficient to mention that the record for low single and low games is held in Toronto. A second series, open to the Dominion, will be rolled during the week of February 12th.

DOMINION CIVIL SERVICE POSITION OPEN

The Civil Service Commission of Canada announces an open competitive examination for the following position.

22956. An Assistant Chemist (Male) for the Seed Branch, Department of Agriculture, Ottawa, at an initial salary of $2,220 per annum. By legislation this salary is subject to a deduction of 10 per cent during the fiscal year beginning April 1, 1933.

Duties.—Under direction to perform difficult chemical analyses, on feeding stuffs, fertilizers, economic poisons and related matter, and to perform other related work as required.

Qualifications Required.—Graduation from a university of recognized standing with specialization in Chemistry; at least three years of laboratory experience subsequent to graduation in a commercial or similar laboratory in Analytical Chemistry; preferably some experience in the analysis of compounds of copper, lead, arsenic, sulphur, and of alkaloids and other organic compounds; accuracy and aptitude. While a definite age limit has not been fixed for this competition, age may be a determining factor when making a selection.

Nature of Examination.—A rating on Education and Experience will be given from the sworn statements, supporting docuents and other evidence submitted by applicants. Candidates must give full particulars regarding their technical training and experience, especially as they bear on the qualifications for and duties of this class of position. An oral examination may also be given, if necessary.

Although this competition will qualify for permanency, the appoinment will for the present be on a temporary basis and for such period, probably not exceeding six months, as the Department may require. The person selected will be eligible for re-engagement for similar work in successive seasons, and in the event of securing permanent or seasonal employment will be eligible for increases at the rate of $120 per annum until a maximum of $2,700 has been reached.

An eligible list may be established which will be valid for a period of one year. Application forms properly filled in must be filed with the Civil Service Commission, Ottawa, not later than Febrauary 1, 1934.

NOTES AND NEWS

R. Harcourt (Toronto '93), Head of the Chemistry Department, Ontario Agricultural College, Guelph, has been elected President of the Association of Official Agricultural Chemists. This organization covers the United States and Canada and the appointment of Dr. Harcourt is a signal honour to himself and the O.A.C., particularly so in view of the fact that the Association celebrates its Fiftieth Anniversary next year and this is the first time a president has been chosen from outside the United States.

C. W. Buchanan (Toronto '11), formerly Agricultural Representative for the Thunder Bay district with headquarters at Fort William, has been transferred to Napanee as representative for the Counties of Lennox and Addington.

A. A. Toole (Toronto '12) has been appointed Agricultural Representative at Fort William, Ont.

H. M. Thompson (Alberta '33) has changed his address to Box 46, Abbotsford, B. C.

E. L. Eaton (Toronto '20), formerly Professor of Agronomy and Farm Superintendent, Nova Scotia Agricultural College, is now farming at Upper Canard, N.S.

R. Innes (McGill '11), formerly Deputy Minister of Agriculture for Nova Scotia, is now farming at Coldbrook, N.S.

W. A. Middleton (McGill '13), formerly Professor of Horticulture, Nova Scotia Agricultural College, has returned to his home in British Columbia.

A. C. Heise (Manitoba '18), formerly Dominion Seed and Feed Inspector, Dominion Seed Branch, Fort William, has changed his office address to Customs Building, North May St., Fort William, Ont.

E. Boudreau (Laval '32) is now with the Live Stock Branch of the Quebec Department of Agriculture and is located at Quebec City.

John Maxwell Armstrong (Saskatchewan '25), Cytologist, Forage Division, Central Experimental Farm, Ottawa, was married on December 28th, 1933, to Lillian Hay (B.A., Sask. '32) of Saskatoon. Dr. Armstrong has recently received his Ph.D. from McGill, and is located in Ottawa.

N. S. Golding (Toronto '14), formerly Associate Professor of Dairying, University of British Columbia, is now Associate Professor of Dairy Manufactures at the College of Agriculture, University of Idaho, Moscow, Idaho.

The sympathy of members of the C.S.T.A. is extended to Mr. L. H. Newman, Dominion Cerealist. Mr. Newman lost both his mother and his brother during the first ten days of the New Year. Both were apparently in the best of health and their death has been a great shock to members of the family. Mr. Fred Newman was with the Poultry Division of the Dominion Live Stock Branch.

NEW MEMBERS

The following members have been received since June 1, 1933:

Rosairo Barabe (Laval 1932, B.A.), Ste Anne de la Pocataire, P.Q.
H. D. Branion (Toronto 1928, Ph.D.), Guelph, Ont.
A. J. Cooper (Manitoba 1931, B.S.A.), Brandon, Man.
J. A. Eaket (Manitoba 1930, B.S.A.), Winnipeg, Man.
T. L. Forster (Manitoba 1933, B.S.A.), Winnipeg, Man.
Eugene Godbout (Laval 1932, B.A.), Ste. Anne de la Pocatiere, P.Q.
Gostick, Frank (England 1897, N.D.D.), Winnipeg, Man.
J. A. McGregor (Manitoba 1923, B.S.A.), Winnipeg, Man.
J. McLean (Toronto 1921, B.S.A.), Winnipeg, Man.
W. S. Nesbitt (Manitoba 1931, B.S.A.), Shoal Lake, Man.
John H. Parker (Minnesota 1913, B.S.), Manhattan, Kansas.
H. A. Purdy (Saskatchewan 1932, B.S.A.), Saskatoon, Sask.
C. E. Rich (Saskatchewan 1927, B.Sc.), Moose Jaw, Sask.
T. W. T. Smith (Saskatchewan 1932, B.S.A.), Saskatoon, Sask.
Robert Whiteman (Manitoba 1912, B.S.A.), Winnipeg, Man.
O. Winkler (Manitoba 1931, B.S.A.), Canora, Sask.